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THE DWINGELOO RADIO OBSERVATORY

Organization

Ten years ago the title of this paper would have seemed devoid of meaning. Dwingeloo then was, and still is, a village lying amid woods and fields, a rural community. It had no connection with any university or with science. Now it is a name well-known to astronomers throughout the world and listed as an observatory at longitude $25^{m} 35^{s}.2$, latitude 52°.813.

The term "radio observatory" was unheard of ten years ago, although the expression "radio astronomy" had begun to find acceptance. The experiments of engineers receiving radio waves from extra-terrestrial objects had already attracted keen interest among astronomers, but no effort had yet been made to organize a regular radio observatory. I remember using the term "Radio Observatory" for the first time in the title of a popular paper describing the splendid research done at the Radiophysics Laboratory at Sydney.

A change has now come about in all this. If we judge by the number of hours devoted to useful observation with a single telescope, we should find that the Observatory at Dwingeloo deserves its name 25 times better than the largest normal (optical) observatory in Holland, the Leyden Observatory. An optical instrument in our climate does not often exceed 250 hours of observation a year. The Dwingeloo radio telescope, however, has averaged about 6,000 hours a year for the past few years, which comes to about 70 per cent of a continuous day-and-night observation schedule.

The plan to build a big radio telescope in Holland was conceived shortly after 1945 and in 1956 the observatory, equipped with such a telescope was officially opened by Her Majesty Queen Juliana. At that time its 25-metre telescope was the largest in operation anywhere in the world. At present several other telescopes of similar size are in use or in construction throughout the world. The telescope at Jodrell Bank – 75 metres in diameter – is a giant among the giants.

The Dwingeloo telescope is an all-steel construction made by the firm of Werkspoor, Holland. Its main components are the paraboloid mirror, 25 metres in diameter, covered with wire mesh, the 12-metre mast, carrying the dipole antenna at the focus, and the supporting tower, turning on a circular rail and containing the observation house. A specially designed co-ordinate converter in the observation house enables the telescope to follow the daily motion of any point in the sky with an accuracy of about one minute of arc. The width of the antenna beam, at a wave length of 21 cm is 0.57 degrees. This means that the instrument simultaneously registers the radiation from an area in the sky slightly bigger than the full moon. The observatory, including living quarters, laboratory rooms and two smaller radio telescopes, cost 950,000 guilders (£95,000) to construct, and the annual running costs amount to about 300,000 guilders (£ 30,000).

Equal in importance to the huge radio telescope are the smaller, highly specialized radio receivers, for it would be of no use to concentrate the radio waves from an object in outer space into the focus of the parabolic reflector, if they could not be picked up and directed further from this point. This is achieved by an antenna at the focus and an amplifier, which is mounted partly with the antenna at the end of the mast, partly behind the mirror at the foot of the mast, and partly in the observation house below. The final element is a recording meter which registers the total intensity of the radio noise thus received. The radio telescope defines the direction from which the radiation is received (within a certain "beam width"); the receiver defines the frequency of this radiation (within a certain "band width"). The beam width is about

$$70° \times \frac{\text{wave length}}{\text{diameter of disk}} \text{ and}$$

can be narrowed only at the cost of building a bigger telescope, if the wave length has been chosen for other reasons. The band width can be greatly reduced by tuning the amplifier circuits. This may be useful if a fine spectral resolution is sought. For instance, in some investigations of the 21-cm line a band width of 5 kc/sec, corresponding to a spread in Doppler velocities of 1 km/sec, was used. This is a far better result than any that can be reached with the best astronomical spectrographs in the photographic and visual spectrum.

The final record does not disclose where the radio noise has come from. A quite common situation in radio astronomy is that the extra-terrestrial radiation which is the aim of the study contributes only a small part of the total sound measured. For instance, we may have

radiation from a certain Nebula 2° K(Kelvin)
radiation from the ground and other objects in the vicinity : 40° K
noise produced in the receiver itself: 600° K

The employment of the Kelvin degree as the unit of noise intensity derives from the eventual use of a warm or cold resistor instead of the antenna as a basis for comparison. If the small value of 2° K is to be measured with 10% accuracy, some differential method of measurement has to be devised in which the large value of 600° K can be kept constant to the degree of 1/30%.

Such problems occur in wide variety and the methods to cope with them are equally varied. However, invariably they require highly specialized equipment that is hardly obtainable from industry and sometimes not at all. The receivers in use in the Dwingeloo Observatory, which rank among the best available in the world, have all been patiently developed by our radio-astronomical engineers to deal with their particular problems.

Throughout the stages of planning, experiments and reduction the closest co-operation between astronomers and engineers is desirable.

The "Netherlands Foundation for Radio Astronomy" (Stichting Radiostraling van Zon en Melkweg) was set up with this aim in mind. Its board of directors includes scientists from three university observatories, from the P.T.T.*) (for telecommunication, ionosphere, interference problems), from the Philips Research Laboratory and from the Meteorological Institute.

The task of initiating and maintaining efficient co-operation between experts of different training and ideas, using a different terminology, is never easy, though the present system has solved most of the problems involved. The staff engaged in one aspect or other of radio-astronomical research has steadily grown. Over thirty persons are now working full-time in radio astronomy, the majority being employed by the Netherlands Foundation for Radio Astronomy and the rest by the Universities

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*) Post-Telegraph-and Telephone Service

Ten of them have their daily work at Dwingeloo; others go there occasionally or have a full-time job in the reduction of data elsewhere. Subdividing this personnel according to the type of work performed, we obtain three almost equal groups. The first group consists of persons having a full academic degree or thereabouts. This group includes three radio-engineers, a physicist, five astronomers and several graduate students in astronomy. The second group consists of technical assistants ranging from simple technicians to fully skilled mechanics and radio specialists, who do most of their own design work. The third group consists of computers and a draftsman whose work is largely concerned with the long process leading from unreduced tape to publication. The time needed for the reduction process ranges from 2 to 12 times the time during which the telescope was in use, depending on the type of programme. Hence the size of the present computing staff is not really adequate. Efforts to cope with the work by partial automation are in progress.

The impact on teaching and research at the universities has been great. At present about half of the research effort of the Leyden and Groningen observatories is directly concerned with radio astronomy. Second and third-year students often go to Dwingeloo for two weeks as voluntary observers, receiving room and board and a small allowance. The university courses contain little matter on the technical aspects of radio astronomy but much on radio-astronomical results, discussed in the appropriate context with results from optical astronomy.

Scientific Aims

The aim of this work is to expand our knowledge of, and deepen our insight into, the laws of nature and the structure of the universe. The old but imperfect definition to the effect that "astronomy is the study of the stars" is singularly inadequate in this case. No star has yet been detected by radio astronomy, except one, our Sun. The Sun is a normal, average star and because it is only 8 light-minutes away from us, we receive fairly powerful radiation from it. This radiation shows many interesting features in its distribution with frequency, with position on the Sun's disk, and particularly in its continual variations with time. A modest programme of solar research is conducted by a research group from Utrecht University, working with one of the smaller radio telescopes at Dwingeloo. The aim is to measure in the 60—100 cm wave length range the sudden bursts of radiation, together with some data on their band width and polarization, on the basis of 8 simultaneous very rapid recordings with a time resolution of 1/100 second. In view of the connection between solar radio waves, the ionosphere and practical problems of telecommunication, other observations of solar radio emission are made at the "NERA" receiving station of the Netherlands Post, Telephone and Telegraph Service.

The other stars, at distances of light-years, light-centuries, and beyond, are too faint for detection. Nevertheless, the radio study of the sky reveals a wide variety of interesting objects. Some of these are prominent in the long waves (3-30 metres), others more prominent in the short waves (3 to 30 centimetres). Some types of object are concentrated, like the stars and the visual light from the sky, in the regions of the Milky Way, whereas other objects do not seem to have any relation to the Milky Way. Some extend over areas of many degrees on the sky, so that by simple sweep of the comparatively crude antenna beam they are seen to be large objects; others may first seem like narrow points of radiation. These "discrete sources" were for some years after their discovery called "radio stars" but this name was abandoned when it turned out that most (or all) of them have measurable diameters, often of several minutes of arc. They are gaseous nebulae of diverse type and large systems of stars like our own Galaxy.

This brief summary may have made it clear that nature presents us with far too many interesting problems for one radio observatory to tackle. A careful choice of the most promising objects and frequencies has to be made.

The 21-centimetre Line

The main subject chosen for Dwingeloo was the 21-centimetre line. This line forms a subject apart, which has not even been mentioned in the enumeration of interesting subjects listed above. All discrete sources and extended objects so far mentioned emit radiation in a continuous band of wave lengths ranging from very short to very long, but the 21-centimetre line occurs at a fixed wave length. It is emitted by hydrogen atoms throughout our Galactic System and in other Galaxies.

The natural frequency of this line is 1420.4057 Mc/sec, the natural wave length in vacuo is 21.1064 cm. However, if the atoms move away from us (the earth), the measured wave length is slighty longer by Doppler effect while, if they approach us it is slightly shorter.

More than two-thirds of the observation time at Dwingeloo is devoted to the 21-cm line. The possible importance of this line in investigations of galactic structure had already been foreseen seven years before its discovery. For not only is it possible to determine, by pointing the radio telescope, in what direction the clouds of hydrogen atoms are located, but it is also possible, by measuring the precise frequency, to find how fast they move towards or away from us. This additional piece of information may, subject to certain assumptions and restrictions, be converted into a distance estimate.

The result is that the clouds of hydrogen can be located in three dimensional space and that a full three-dimensional model of the distribution of atomic hydrogen in the Galactic System can be made. This is, indeed, what has happened. In 1944 the first prediction was made, but radio techniques were too crude at that juncture for detecting the line. It was in 1951 that American, Dutch and Australian radio-telescopes first registered the signals of galactic hydrogen atoms.

In Holland, several years of technical improvement and of assiduous observation with a small radio-telescope at Kootwijk followed. These investigations opened such a completely new chapter in our knowledge of the Galactic System, that the Kootwijk maps may now be found in many astronomical textbooks. Somewhat later radio astronomers in Sydney also covered a great part of the Milky Way, including the quadrant that is invisible from Holland. A combined map of the spiral arms in our Galaxy, prepared jointly by an Australian and Dutch radio astronomer in the autumn of 1957, is reproduced in Plate 3.

In the meantime, the plans for the big 25-metre telescope in Dwingeloo were made to give optimum performance at 21 cm. When the telescope was ready in 1956, Mr. C. A. Muller, who had developed the receiver for the 21-cm line from the beginning, had one receiver ready to go in and another, with simultaneous registration in eight channels, under construction.

The programme since that time has not aimed at repeating the general maps of galactic hydrogen with greater detail; twenty years might be spent doing this with reasonable completeness and accuracy. Instead, we have tried – with varying success – to select the most exciting objects. Unexpected discoveries have also turned up and have to some extent influenced our further plans. A brief summary follows of the main lines of research at present being pursued, from near to far objects.

1. Selected regions at high galactic latitude

The Galatic System, with its most common stars and hydrogen clouds, forms a very flat disk. The diameter is at least 30,000 parsec, the thickness 200 to 300 parsec. (1 parsec = 3.2 light-years). Our small observation point, the Sun, is near the plane of symmetry and roughly halfway between the centre and the edge. Hence we see most of the interesting objects in the narrow belt of 5° or 10° around the galactic equator, which is called the Milky Way. Looking at higher angles away from the plane we see only relatively nearby parts of the galactic disk.

The hydrogen line radiation from some of these parts has been investigated at Dwingeloo. For instance, the Orion region is at a distance of 500 parsec. It contains one of the youngest complexes of stars, probably formed from interstellar gas only a few million years ago, and still mixed up with gas and dust clouds with weird forms and vigorous motions. The radio results form an excellent complement to optical studies, but the work has not progressed far enough to draw clear conclusions.

2. The hydrogen line in absorption

About six sources of continuous waves emit enough radiation in the 20-22 cm band to show the absorption effect of the intervening hydrogen atoms at 21 cm. Excellent measurements of these absorption effects have been made at Dwingeloo. They provide data on the relative speeds and internal motions of hydrogen clouds that cannot be obtained in any other manner, and incidentally, they give useful indications of the distances of the sources concerned.

3. Expanding motion near the centre of the galaxy

The galactic disk with its gas and stars does not rotate like a solid wheel. The period of revolution, which is 260 million years near the Sun, gradually becomes shorter for points closer to the centre. This model formed the basis for constructing the map reproduced in plate 3. Something goes wrong, however, with this model when we approach within 3,000 parsec from the centre. This was discovered in Kootwijk but the data were not sufficiently precise to find out what was the matter. Observations in Dwingeloo soon revealed that the gas in these central regions not only rotates but moves away from the centre in an expanding motion. The speeds are in the range of 50-100 km/sec and perhaps as high as 200 km/sec. The gas in this region is still contained in spiral arms and still confined to a very thin disk, which makes the phenomena even more mysterious.

This expansion may prove to be one of the most fundamental discoveries of modern astronomy and may give clues to the dynamics and evolution of the Galactic System. It seems likely that magnetic fields are involved, somehow, but for the rest the explanation is entirely obscure. Virtually the entire time during which the central region of the Galaxy is above the Dwingeloo horizon (about two hours per day) is used for a further study of this prenomenon.

Similar observations have not yet been made elsewhere, because they require elaborate precautions for stabilizing the instrumental zero line.

4. Hydrogen in the nearest galaxies

After the Australian radio astronomers had mapped the Magellanic Clouds, the two satellites of our own Galaxy, and had shown that about 50 per cent of their mass consisted of hydrogen gas, we were anxious to make such measurements on other nearby galaxies as well. About 1,500 observation hours have now been spent on about 15 of such galaxies. The radiation is almost invariably weak so that an accuracy of 0.1° K in the intensities is necessary.

In the nearest and largest galaxies, for instance the Andromeda Nebula, it is possible to determine the distribution of hydrogen and the law of rotation. The smallest objects permit us to obtain only the total amount of hydrogen and a rough measure of the internal motions. Nevertheless, the combined results already show a clear relationship: "intermediate" spiral systems like our own Galaxy or the Andromeda Nebula have a small percentage of hydrogen; "later" and "irregular" systems have 10 or more per cent, whereas "earlier" spirals or "elliptical" systems have less than 1 or even 0.1 per cent. The terms "later" and "earlier" will have to be revised in terms of new views on the evolution of the spiral nebulae.

The results just mentioned, though not quite unexpected, will certainly help us at arriving at new views of this kind.

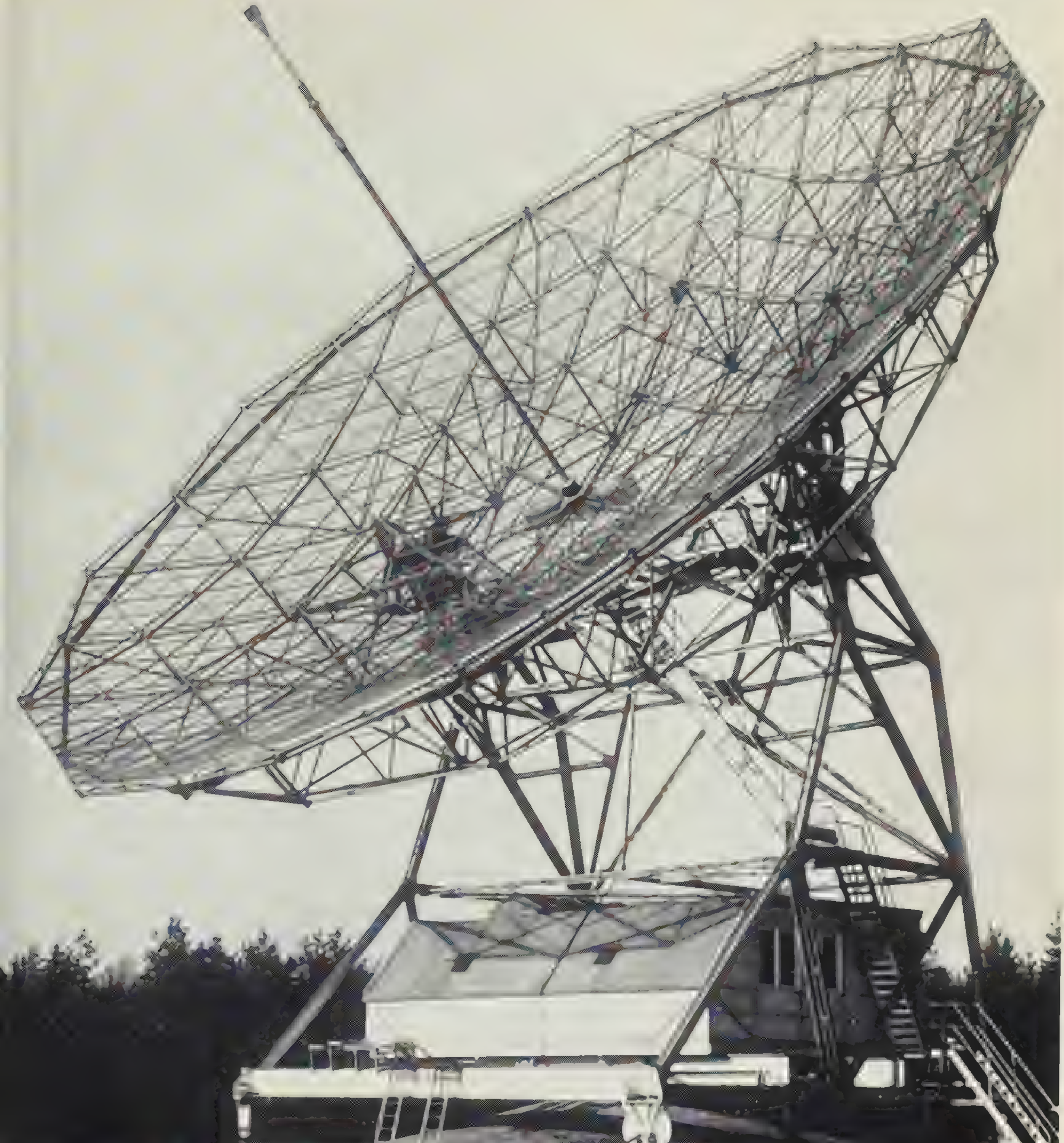
5. Clusters of galaxies

Disappointments were not lacking however. A concentrated effort was made to reach even farther into space with the 21-cm line. The Coma cluster of galaxies, which was expected to have gas dispersed between its member galaxies, seemed a suitable object. Moreover, in one set of experiments an American radio astronomer had claimed to have observed the 21-cm radiation from this gas. The recession velocity is 7,100 km/sec, which requires a strong detuning of the receiver, brings new interference from distant radar transmitters and new uncertainties about the instrumental zero line. However, on several occasions, when proper regard had been had to all these factors, good measurements were made. The present result is a peak intensity of –0.05 ± 0.1° K, or, translated into ordinary words: zero for all we can measure.

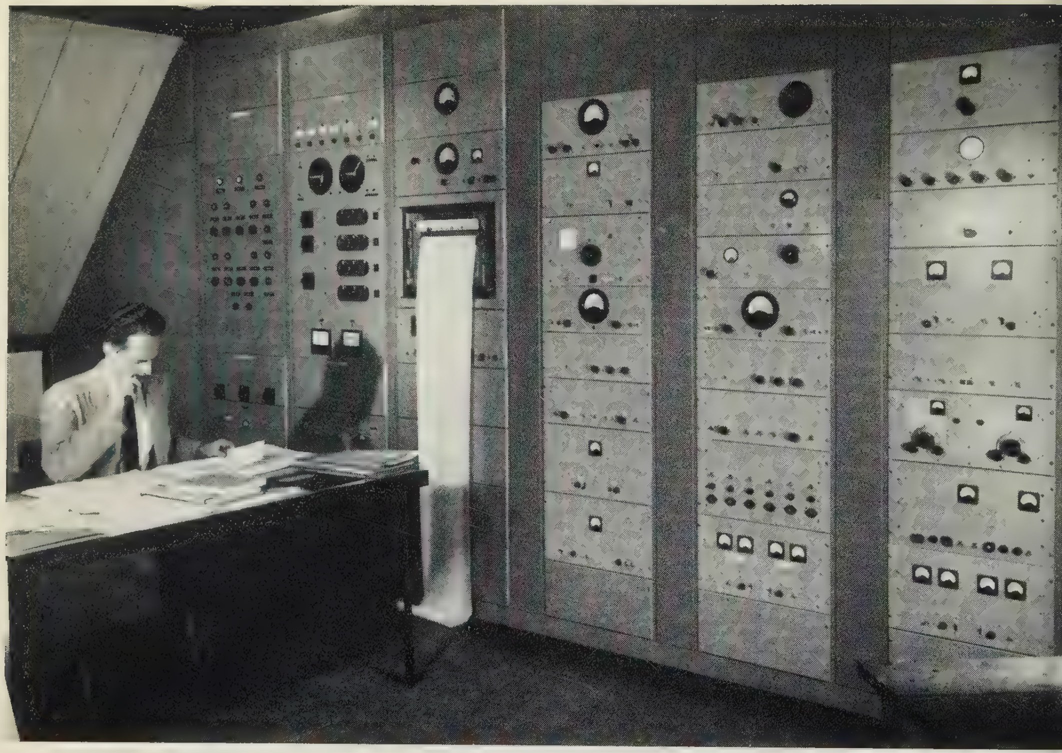
Continuum Studies

The emphasis on the 21-cm line should not cause us to forget the sources of continuous radiation. In many respect these are even more exciting, because their physical nature is less clearly understood. Most of them radiate by processes that are quite different from the thermal emission processes in classical astrophysics. The choice of wave length is not critical. However, different sources and components of back ground emission have different rates of intensity change with frequency. Hence the maps look quite different in different frequency ranges. Not all frequencies are equally suitable for the Dwingeloo telescope. At 3 metres a larger and cruder structure would be preferred; at 3 cm the waves would pass right through the reflector. Hence it was decided to make initial continuum studies at 22 cm and 75 cm. At both wave lengths virtually complete maps of the sky, together with more precise studies of special regions, have been made.

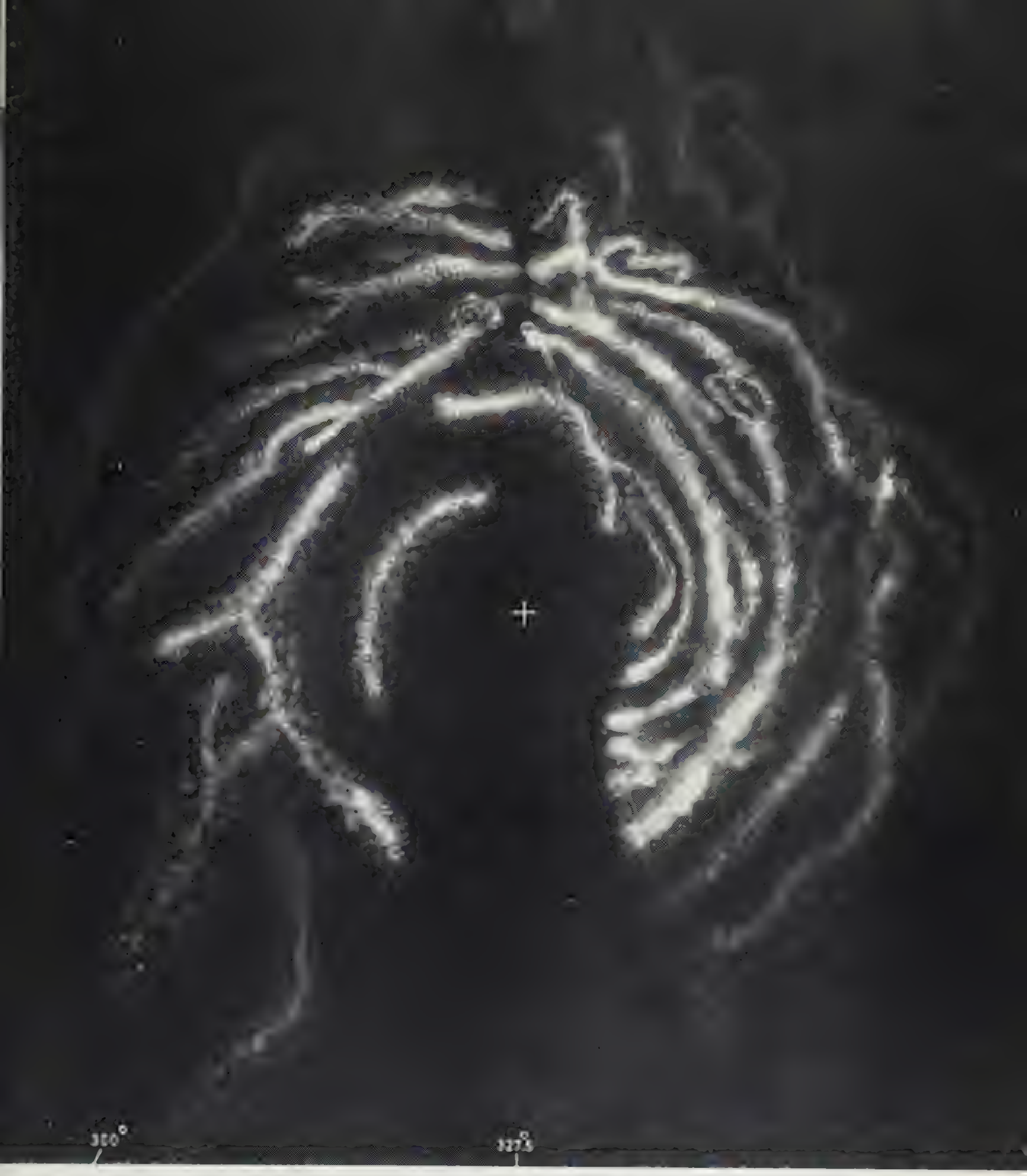
The 22-cm survey formed or natural preparation to the 21-cm line studies. The positioning of the telescope and many effects in the instrument and in the atmosphere



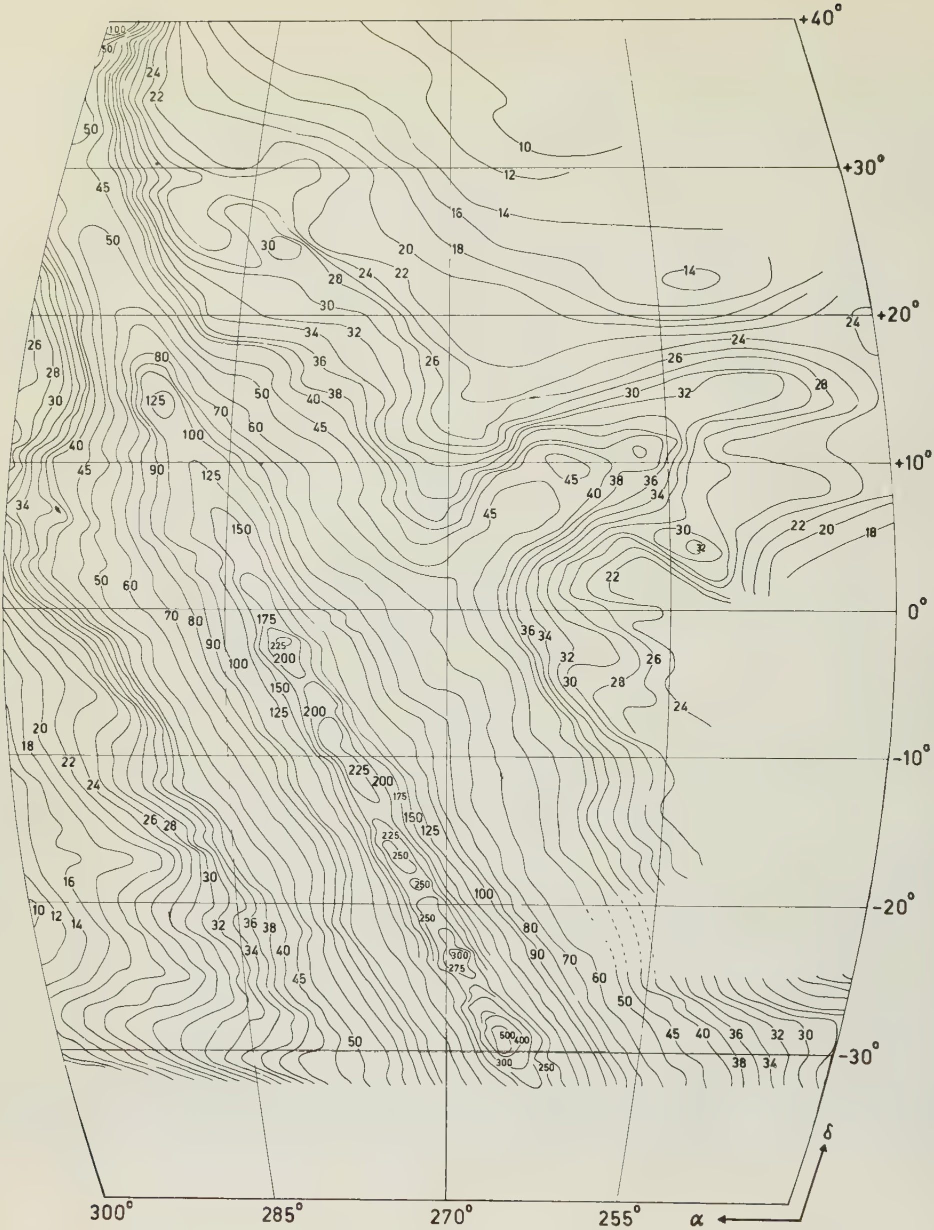
1. View of the 25-metre telescope equipped with a 21-cm antenna.



2. Interior view of the observation house. Three panels contain the telescope controls and position indicators. Three further panels contain the hydrogen line receiver.



1. Distribution of atomic hydrogen in the galactic disk on the basis of observations made in Austrialia and the Netherlands. The spiral arms are clearly seen.
+ = centre of system, ⊙ = Sun
The sectors left open are not empty, but the reduction method fails in these directions.



4. The main feature of this section of the continuum survey of the sky at 75 cm is the ridge along the galactic plane. The protrusion to the right has been found in surveys at other wave lenghts too, but has not been identified with an optically known object.

could be better studied with a continuum receiver than with the line radiation. Moreover, corrections for the continuous background have to be applied in the final reduction of the line data. However, the continuum data themselves are more interesting. About half of the discrete sources seen at this frequency may be indentified with gaseous nebulae photographed on the Mount Palomar Map of the Sky. Many of them are classical thermal emitters consisting of ionized hydrogen gas with a temperature of about 10,000° K. However, many other sources appear with stronger intensities at the longer waves, which shows that they are non-thermal.

At 75 cm the situation is quite different. All intensities are higher. The Milky Way forms an impressive band along a full circle with fainter details that can be traced over the entire sphere. The many discrete sources that can be detected among them are almost invariably non-thermal. The accepted term "non-thermal" for these sources is a confession of ignorance on the part of the radio-astronomers. However, there is also a general feeling that the radio emission in most of these sources and perhaps also in the general galactic radiation is caused by cyclotron radiation. This means that cosmic-ray electrons, i.e. electrons moving with velocities near the velocity of light, describe helical orbits in galactic or nebular magnetic fields and, in doing so, emit radio waves. In respect of one source, the Crab Nebula, which is the remnant of a stellar explosion of 9 centuries ago, this explanation is certainly correct. In an impressive set of optical and radio observations in the USSR, the USA, England and the Netherlands all of the predicted properties of the Crab Nebula, on the basis of this explanation, were verified. Among these observations were the first ever made at Dwingeloo. In November 1955 construction work on the motors and gear-boxes was twice interrupted for some days in order to observe with the half-ready 25-metre telescope an occultation of the Crab Nebula by the moon. This yielded the accurate radio size of the nebula; a new opportunity will not be forthcoming before 1963.

The 75-cm radiation from the galaxy has been mapped but is still very imperfectly understood. Even quite strong features, like the protrusion in the right half of Figure 4, remain completely mysterious. Tentative explanations have been, for instance: an optical illusion arising from a peculiar distribution of electron velocities in the local spiral arm; or a dwarf galaxy in collision with our own! A fundamental check on the entire hypothesis of cyclotron radiation would be to observe the polarization of the galactic radio waves. Attempts in other countries have failed so far. Attempts to measure this polarization at Dwingeloo with more sensitive equipment will be made in the near future.

It seems prudent to maintain silence about further plans for the future. If the present effort can be kept up, or increased, the chances are that new and exciting discoveries lie in store for us.

H. C. van de Hulst *

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*) Dr. H. C. van de Hulst is Professor of Theoretical Astronomy at the State University at Leyden.

SOME OBSERVATIONS ON MEDICAL RESEARCH

Text of an address delivered by Professor A. Querido on May 23 last, on the occasion of the inauguration of the Rheumatological Clinic's New Laboratory at Leyden.

You have been so kind as to ask me to say a few appropriate words on medical research on the occasion of the opening of your splendid new laboratory, and although I should not like to be taken as one who devotes his time to making speeches on this subject — mindful as I am of George Bernard Shaw's aphorism "Those who can, do; those who cannot, teach" — nevertheless I have accepted your invitation for several reasons. In the first place, because it is a delight to me to be able to do your Institute a service, and this was necessary in this case, since Dr. Walter Bauer of Boston, who was to address you, has unfortunately been prevented from coming. Secondly, and this is not the least of my reasons, because I rejoice in the opening of this new laboratory for — as far as I am aware — it represents the first team of scientific workers, closely associated with a university clinic, who have been specially trained for their task and who will be devoting themselves fulltime to professional research. This, in my view, is an exceedingly gratifying new development in the Netherlands.

Of course, as you all know, an enormous amount can be said on scientific research in the medical field. One can devote a historical survey to the subject, as, for example, Edwin Cohn of Harvard University has done so lucidly and so engrossingly. Then one can speculate on the future, on the basis of what has been achieved so far and what remains to be done. In this respect I would like to draw attention to two volumes on this aspect of the subject, published by the American Foundation in 1955.

I don't think, however, that observations of this nature form an appropriate topic for me to deal with here today. I have therefore decided to talk to you about two questions which have been put to me on repeated occasions in recent years. They are:

1) Is scientific research in medicine a luxury for the Netherlands? and
2) What conditions must be fulfilled in order that this research shall flourish?

1. Is scientific research in medicine a luxury for the Netherlands?

However strange this question may appear to you, I can inform you that it has been put to me in all earnest by highly placed officials. The idea which prompts it is that such huge sums are being spent on this kind of research in other countries (already more than 1,000 million guilders a year in the United States – a figure which it is expected will have risen to 4,000 million by 1970) that the Netherlands cannot hope to compete and should not, therefore, indulge in such research. For every university man the idea that scientific research should not be carried out in his particular discipline it totally incomprehensible. To him, science requires no justification — he takes the "pursuit of knowledge" to be a matter of course.

I won't discuss whether this viewpoint is right or not — though experience has taught me that many people who have not been educated in natural philosophy find the argument inadequate. But there is an abundance of other replies to our question.

The slogan "Medical research of today is clinical medicine of tomorrow" — I no longer remember the source of the saying — is superficial and inadequate. What we need is a reply which explains why this research is necessary for *the Netherlands* It is not difficult, I feel, to link this matter up with research in the natural sciences — the need for which, for our nation's continued welfare, not a single government official will question.

Such research has now found acceptance. But scientific research in the medical field cannot be separated from natural science research. Research into the causes and the mechanism of disease is nothing other than the study of the disturbance of processes, or of the organization, of the living organism and is *ipso facto* a biological, i.e. a natural, science. The link with the biological sciences (such as biophysics and biochemistry etc.) involved in problems to do with agriculture and cattle-breeding is inseverable, and there is highly intense contact in both directions between these fields of study. Finally, the significance of medical research for the pharmaceutical industry and the allied chemical industry is self-evident.

An entirely different aspect of the problem became clear to me a short time back, after perusing an article by J. B. Conant entitled "The Impact of Science on Industry and . . . Medicine." Does not this title itself convey that the intellectual's endeavour is of service both to our material welfare and to our health, i.e. that it serves the well-being of the individual, seen as the principal figure in our civilization? The obstinate, however, will not accept that this idea also implies that the Netherlands too must take an active part in the process. I admit that in this case it is no easy matter to produce a counter-argument, though to my way of thinking we can pursue our particular argument quite forcibly in the following way. In the last resort, a nation gets medical help whose quality is determined by the kind of training its doctors receive and have received. No one can deny that it is impossible to provide higher education in the absence of scientific research. Our English neighbours make a distinction between "instruction" and "education," the latter involving training in independent thinking, and such training can only be given by instructors who are practising such thinking themselves by means of scientific research. Here is another argument which explains why scientific research in medicine is necessary in our country. I am quite aware that much of what I have said is common knowledge — and I dearly hope that many of you will have found my remarks so far (remarks in which I have deliberately tried to avoid such expressions as "aiding suffering humanity") as superfluous as I myself find them to be.

2) What conditions must be fulfilled in order that this research shall flourish?

As you will realize, if other countries are spending millions of guilders every year on scientific research in medicine, a number of detailed studies on the organization of such research will have appeared in the course of the years, studies with which I shall not be able to vie in the short time at my disposal here today. For those interested in this subject of the organization of fundamental research, I would just mention in passing an article on the matter published in 1958 by Sir Charles Harrington, director of the English National Institute for Medical Research, where about 150 men of learning and 400 technicians are engaged full-time on medical research. A highly stimulating work on the place of clinical research in medicine is the crystal-clear exposition given in the British White Paper entitled "Clinical Research in relation to the National Health Service," issued in 1953. As far as practical organization is concerned, I would refer you to such small books as "Ward 4" by James Howard Means and "Principles of Research in Biology and Medicine" by Dwight Ingle, which also provide one with an idea of the problems the leaders of such research encounter. This brief summary will be sufficient to show you that the experts have already thought and written a good deal on the subject.

I shall endeavour to throw into relief two aspects of the matter based on my experience of conditions in the Netherlands which lie near to my heart. The first is concerned with the profession of "scientific research worker" and the second with the research worker himself.

A study of the history of scientific research reveals that it was only in the second half of the nineteenth century that institutes began to be founded for this purpose. Prior to this, research had been carried out by isolated individuals, usually as a hobby. They were amateur scientists. During the second half of the nineteenth century a new *profession* evolved, that of *scientific research worker*, a man usually attached to some institute or university. According to Conant, around the year 1900, the prominent research workers in the natural sciences were no longer amateurs but professional research men. This development had a profound influence on industry and medicine. Medicine, it is true, followed at a slower pace than industry, but the same principle, i.e. "full-time" research formed the basis for the foundation of the Institut Pasteur in Paris, the Robert Koch Institut in Berlin, the Lister Institute in London and the Rockefeller Institute in New York. One can't help asking oneself why a country as rich as the Netherlands was at the time did not follow suit.

A further development was that the purely clinical sector, which was coming increasingly to rely on the biological sciences, began to win recognition as a science. In the beginning the term "fundamental research" was reserved for the non-clinical sectors, such as physiology, anatomy or biochemistry, and these branches were afforded every opportunity for further advance. Gradually, however, the idea won ground that the distinction made between fundamental and clinical research was incorrect, if the term "fundamental research" is applied to all research which does not have any practical consequences in view. This interpretation of the term is as applicable to the study of clinical processes as it is to those of biochemistry or physiology. In the clinical sector too it soon became clear that such research can only be carried out fruitfully if a large part of the day's work can be devoted to it without too much interruption. It requires too great a technical and theoretical knowledge of non-clinical subjects to be performed incidentally with success. The result was that in this sector as well the profession of "clinical research worker" grew up so that there, too, amateurism was gradually excluded. Sir Thomas Lewis provides us with a good example of this around the year 1920. In most cases the function of clinical research worker was allied to a university function, such as that of full-time professor with a limited routine task, as found in many Anglo-Saxon universities subsequent to 1925. They differed from their predecessors particularly in the fact that they were young men who had qualified in the non-clinical sector in addition to their clinical education. Nowadays a modern unit is built up of a leader of this kind acting as a liaison between the *clinici practici* and the practitioners of what are known as the "basic subjects" in the unit.

In both the clinical and the non-clinical sectors the same development had taken place as that which had taken place earlier on in the natural sciences, i.e. the training of the professional research worker.

It is not necessary to say that notwithstanding excellent equipment and other accessories, it is the research worker himself who determines the quality of the work done. The most magnificent building, with the very finest equipment and a flawless programme, will produce no satisfactory research, if the research worker is not qualified to do his job. As a result, the thing that matters most is the selection of the research worker and early and appropriate training to equip him to use the means put at his disposal. Once he has acquired the necessary qualifications, it is desirable that reasonable trust should be placed in his plans, while it is the task of his superiors, the board of governors or whoever else they might be to ensure that his time is not wasted on jobs for which he has *not* been chosen, such as the design of buildings, too frequent attendance at committee meetings and the like. The scarcity of good research workers in the Netherlands has led to an unhealthy practice which also has a hampering effect on their output. They are appointed at too early an age as the heads of institutes so that they have too large a staff to manage and too great a responsibility to carry. Experience has taught us that an active young research worker cannot provide guidance to more than two or three unripe university men at a time.

We may ask what are the qualifications which make a good research worker. It goes without saying that a certain measure of intelligence, the ability to put two and two together and keen observation are essentials, but they are not all. Another characteristic — the urge to explore, I would like to term it the *impetus explorandi,* is an even more important requirement. The difficulty is that the motives and factors which govern this urge to explore are lacking in our country so that we cannot influence them as we might wish. One of the few factors recognized is the influence brought to bear by the teachers, who are in a position to engender the *impetus explorandi* by their own enthusiasm and example. But what then? The urge to explore may be strong or weak, and the path that leads to the discovery and establishment of a new fact is always long and difficult. The research worker has to follow that path, year in, year out, encountering many disappointments in his work, and, if he achieves but little success, with scant recognition from the outside world, unless there is some special interest in his work. To an extent, his work is comparable to that of an artist, a musician or painter, though the latter have an advantage over him in that they work in a medium where they can make contacts with non-professionals, from whom they may find recognition and encouragement. The research worker can only achieve this contact with non-professionals, if he makes some spectacular discovery. And there are all manner of factors which can weaken the *impetus explorandi,* such as lack of interest in his work on the part of his wife, family or other worries, financial problems, etc.

So much for the *impetus explorandi,* which is a condition of the first order of importance. Next comes the research worker's training, which should be as meticulous as that of the musician. After all, one expects something quite different from a professional musician than from an amateur. In addition to the ordinary course of specialist training, the research worker should also enjoy an academic education. Prominent research workers are all at home in one or other of the sciences, be it physics, chemistry or mathematics. The profession mut be learnt under the guidance of its leading exponents (as is the case in the fine arts) and should provide for exercise in criticism among other things.

These are only a few aspects of the requirements the academician must fulfil, if one is to trust him with the costly equipment involved in research. He is undoubtedly privileged but not to the extent that social recognition and remuneration in keeping with the level of achievement he has attained can be withheld from him. If they were, all urge to carry out research would disappear in a few years and all that had been invested in him would be lost.

I have endeavoured by all this to make it clear to you that scientific research is not a job for everyone, and that the creation of the climate in which it can flourish calls for a great deal of knowledge of the matter and a great deal of care and attention. This implies that those whose task it is to provide leadership and guidance in such affairs will only be able to do so with success, if they themselves have belonged to the same group. As I said at the beginning, I have dealt with only a few aspects of medical research. I could have chosen others just as well. I regret, for instance, that I have said nothing about the relation between fundamental and applied research. If I had, I should have defended the view that even in an institute dedicated principally to applied research, a certain place must always be found for fundamental research. Nor have I said anything about the question as to what a team of workers really amounts to. There are, unfortunately, great misconceptions on this particular topic.

However this may be, I hope that I have awakened an understanding among you of the need to foster medical research in the Netherlands, not with amateurs, but with carefully trained and educated research workers. It calls for *a positive policy towards science on the part of our government* and is not a matter which can be left to chance. The most important item of policy is the selection and training of research workers, for it is they who make the music or paint the picture. As Ingle says: no committee has ever been able to achieve this.

Returning to my first question: Is medical research a luxury, I would say this: It is indeed a luxury, if it is carried out with unqualified personnel. If, however, it is carried out by good research workers, it meets an essential need.

Gentleman directors of the Leyden Rheumatological Clinic, it will be evident to you that I have ventured to make these observations here today, because I have every admiration for the way in which you have fostered and developed this team of workers. I wish you every success and would express the hope that your example will be followed in other fields of medical research here in the Netherlands.

A. QUERIDO. *

Literature:

1. Edwin J. Cohn, "Research in the American Sciences," *The American Scientist*, No. 37, pp. 69 and 243 (1949).
2. *Medical Research, A Midcentury Review*, in two volumes. Published for the American Foundation by Little, Brown and Co.
3. "Resources for Research," leading article in *The Lancet*, p. 677 (1958 II).
4. Charles Harrington, "The Place of the Research Institute in the Advance of Medicine," *The Lancet*, p. 1345 (1958 I).
5. *Clinical Research in Relation to the National Health Service*. Medical Research Council and the Ministry of Health. Published by H.M.S.O., 1955.
6. James Howard Means, *Ward 4*, Harvard University Press, 1958.
7. Dwight J. Ingle, *Principles of Research in Biology and Medicine*, Pitman Medical Publishing Company, London, 1958.
8. J. B. Conant, "The Impact of Science on Industry and Medicine," *The American Scientist*, No. 39, p. 33 (1951).

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*) Dr. A. Querido is Professor of Internal Medicine at the State University at Leyden.

SOME NOTES ON A PROPOSED RESEARCH PROJECT ON ISSUES OF SOCIAL CHANGE AND ECONOMIC DEVELOPMENT IN THE MEDITERRANEAN AREA

During the past twelve months the Institute of Social Studies at The Hague has been making preparations for launching a project of *international co-operation* in *multi-disciplinary social sciences research,* of a *fundamental* kind, on problems of *social change and economic development* such as occur in *countries bordering on the Mediterranean.* This project has been designed to yield *practically useful results.* The purpose of this brief paper is to describe the background to, and the stage at present reached by, this effort and also, if possible, to stimulate the interest of scholars in the area concerned.

The Institute of Social Studies was called into being in 1952 by the Netherlands Universities Foundation for International Co-operation as a joint effort of the ten state and private universities of the Netherlands. It was intended as one of a number of activities to further co-operation between Dutch universities and universities abroad. Moreover, its specific task was the study, in terms of the various social sciences (in particular, economics, sociology, public administration, international relations and also, though to a lesser extent, social psychology), of issues of social change and economic development as these may occur anywhere in the world. From the Institute's inception, responsible people realized that if it were to work at all, it should combine teaching and research.

The conditions prevailing when it commenced its work made for a fair amount of stress on the teaching side, and the first years of the Institute's existence have been primarily devoted to the development of its teaching programme, all of which is at the postgraduate level. But in each of these courses, research, both in multi-disciplinary teams and individual research, has been part and parcel of the arrangements.

By now four different courses are being offered regularly each year, and a fifth is in an advanced stage of preparation. Another characteristic element common to all these courses is the composition of the course faculties. In keeping with the idea that the Institute should promote co-operation between Dutch and foreign universities, the regular teaching staff has consistently been kept at the bare minimum needed for developing its programme, the actual teaching responsibilities being shared between them and a considerable number of professors from Dutch and foreign universities, with, in addition, a sprinkling of top-ranking specialists, both Dutch and foreign, from other walks of life.

In admitting participants to its various projects, the Institute looks for academic qualifications, personal interest in the kind of issues on which it specializes, and similar considerations; in addition, it tries to keep an open eye to the distribution of nationalities, so as to promote a maximum exchange of experience and an optimum widening of each participant's horizon. Provided enrollment is at the maximum level for each course, the average number of students living in the residential part of the Institute is between 100 and 125, representing between 30 and 35 nationalities.

By way of expanding the research done in connection with the courses, it has now been decided to develop a research programme not interwoven with teaching.

In envisaging the new perspective of such research activities, the Institute was not entirely free to choose whatever it liked. There were certain basic data that formed a frame of reference within which this new perspective had to be fitted. First, there was the overriding consideration that whatever the Institute undertakes must be in furtherance of international co-operation. Secondly, there was the given fact that this is a social sciences institute concentrating all its efforts on issues of social change and economic development. Thirdly, there was the established, if brief, tradition of the Institute to be taken into account, which makes for the promotion of multi-disciplinary co-operation within the range of the social sciences, as a means of viewing phenomena in a wider perspective. The last consideration was the more interesting as experience in the teaching sector has shown the academic staff of the Institute that an assiduous effort in this respect is bound to yield creative results. This is hardly the occasion to dwell upon the prolonged and elaborate discussions preceding the ultimate choice of a topic of research. Suffice it to state that for a number of reasons preference was given to an area study; not in the merely descriptive sense, but rather in the sense that a chosen area can figure as the spatio-temporal setting in which certain pre-selected analytical problems can be studied. It was thought that, if an international effort could be devoted to the analysis of certain crucial phenomena or issues of social change plus economic development, the most promising framework to this end would be a given area.

The preference for an area study involved one handicap. Analytic research obviously implies the tacit application of pre-supposed theoretical notions to certain existing conditions. But most of the theoretical notions in the social sciences are the typical products of Western civilization, whereas many of the areas presenting us with important issues of social change and economic development belong to other patterns of civilization. In other words, the relevance of existing theory to the conditions likely to be analyzed is not to be taken for granted. But whereas it is not to be taken for granted, it is extremely difficult to assess, for the simple reason that we have no adequate theory of cross-cultural communications. Thus, the kind of research envisaged would in most eligible areas meet with certain basic difficulties rendering it almost impossible to evaluate its effectiveness, otherwise than by the common trial-and-error-method.

There is, it seems, only one area, significant from a point of view of economic development and social change, where this difficulty is of considerably smaller proportions. This is, the Mediterranean basin. The proximity of the two main cultures now bordering on the Mediterranean is more than purely geographical; and as one of the two is the very civilization that is responsible for most of the current social sciences theory as applied at the universities and in government offices, one may cherish the hope that in this particular area the difficulty just described need not shipwreck a project from the very outset.

For this reason, and also for additional reasons like geographical proximity between this area and the country where the present initiative is being taken, it was decided to investigate possibilities for international co-operation in social sciences research on issues of social change and economic development in the Mediterranean area: famous for its history, famous for its contemporary key position in world events and extremely fascinating for any social scientist.

Since this decision was taken, a fair amount of preparatory work, and also of consultation in most of the Mediterranean countries, has taken place, and as a result of these activities, the project is provisionally shaping up as follows.

There can be only one argument strong enough to mobilize the efforts of considerable numbers of research workers in many countries for a social sciences project. This is, that the project, over and above being important from the purely academic and theoretical point of view, stands a fair chance of turning out to be useful as a source of basic data for those whose responsibility it is to guide and promote social change and economic development in the area concerned. In order to meet this fundamental requirement, the envisaged project should not culminate in the production of extensive series of monographs and other works of a descriptive kind. Besides resulting in an inevitable number of such publications, it should produce, or at least foster the production of, some succinct and lucid reports providing those responsible for the formulation and implementation of policy with new, reliable data to go by.

In view of these considerations, the programming of the project must not respond solely to the stated desires of theorists and academicians. It should combine the methodological soundness of such desires with the need for information felt by those facing tasks in the practice of development work: governments and governmental agencies in the countries concerned, as well as other international agencies, like FAO or UNESCO, active in the area. The blending of these two viewpoints will mark one of the most critical phases of the entire project. The project's mode of operation will have to set out from a specification of the notions of "social change and economic development" in terms manageable from the point of view of analytic research. The complex notion of "social change and economic development" will have to be broken down into a number of its theoretical components, and besides this, each of these components will have to have obvious empirical relevance in a number of the regions that constitute the Mediterranean area. To this end, a line of procedure has been put forward that has met with almost unanimous approval. It was argued that the breaking-down of the original complex notion could be handled by formulating a number of "problem clusters," each of which should then stand for a significant aspect of the original complex. Each "problem cluster" could, in its turn, act as the topic of a more or less self-contained research project, so that the original project would thus be broken down into a number of almost independent sub-projects, according to the number of "problem clusters" adopted as topics of research. This should make the anticipated vast scope of the original project considerably more manageable, and should at the same time make for the organizational flexibility that would seem to be essential in a large international project of this kind.

Each sub-project, thus distinguished, could be worked in such a way that a choice would be made first of all of regions in the Mediterranean basin where its topic could be significantly studied. Subsequently, for each region thus distinguished a research team could be mobilized, so that the sub-project would be handled by a number of research teams simultaneously. The activities of all teams should be governed by a working paper, possibly drawn up previously in joint consultation with all of them, in which both the subject and the method of investigation would be laid down in detail. Such regimentation seems inevitable, as the phase of regional investigations by separate teams is to be followed up by a phase of comparison of results, so as to assess which aspects of the phenomena analyzed can be regarded as exclusively local and unique, and which aspects come up for consideration as rather more general functions of social development. The wider perspective thus given to local or regional investigations should be one of the main factors in making the results of this research new and also relevant for practical policy purposes. From these considerations it seems that the Mediterranean area as such appears in the set-up of this project as a presupposition of comparability for pre-estabished topics of local or regional investigation.

To make this point clearer, it is helpful at this stage of the present argument to enumerate some of the "problem clusters" that have been tentatively suggested while preparations for the project were under way.

One is, the function of the countryside in a developing society. In the conflict of opinions between those who hold that the countryside is the backbone of a society's culture and those who believe that it is the main handicap to development work, no course can be steered until research has assessed the true significance of both these part-truths, in terms of the social process of which the countryside is a main constituent part.

Secondly, industrialization and concomitant urbanization, seen from the point of view of underlying conditions and considerations. How really necessary, and how really helpful for development, industrialization and urbanization are, cannot be assessed until they have been analyzed as tendencies, or occurrences, existing in a given material and spiritual framework of social development.

Thirdly, the function of power in developing societies. The many aspects of power, and the many ways in which it becomes effective, must be studied in given spatio-temporal settings, large as well as small, before one can talk sensibly about its sources, nature, impact and potentialities.

Fourthly, the issue of the market and of marketing. A number of problems of topical interest come to the fore in this connection, including the efforts made to promote regional co-operation, especially among the Arab countries, and the repercussions of the European Common Market. No narrow commodity studies are intended here, but a study of one of the crucial elements in the economic growth of the area concerned.

Some further suggestions have been put forward, but these four suffice to give an idea of what is envisaged. Obviously, the term "problem cluster" indicates, besides other things, that for each sub-project teams will be needed of multi-disciplinary composition. This means that in each detail of the project the ideal of multi-disciplinary, fundamental research is kept fully alive, whereas its practical relevance is ensured.

Thus far, reactions to the plan have been preponderantly favourable.

University people and government officials alike have recognized that to conceive a plan of this nature is an act of intellectual and moral courage, and deserves lively attention, if only for this reason. On top of this, institutions and individuals in various countries have already pledged themselves, in principle, to co-operate once the activities begin.

Presumably, the project will not come into the limelight until the middle of next year. The initiators hope to convene an international gathering of representatives of universities, research institutes, planning offices and the like from all Mediterranean countries, in April 1960.

The purpose of this gathering will be to agree on the programme of the entire project, and consequently on the distribution of tasks. A set of working papers will be submitted to the gathering as a basis for the discussions, one outlining the project as a whole, and the others each being devoted to one sub-project or "problem cluster," indicating both its subject matter and its working method in as much detail as possible.

The intervening period till April 1960 will be devoted mainly to the preparation of these working papers. To this end small groups of experts, of international composition and between them representing most of the Mediterranean countries, will be active.

It is expected that the duration of the entire project will be between five and seven years, and that as a result publications will appear in most, if not all, of the languages of the Mediterranean basin.

C. A. O. van Nieuwenhuijze. *

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* Dr C. A. O. van Nieuwenhuijze is Academic Secretary of the Institute of Social Studies, The Hague

CHRONICLE

UNIVERSITY NEWS

Student Population

The total number of students registered at Netherlands universities and institutions of higher education has risen from 32.400 on April 1, 1958 to 34,900 on April 1, 1959, an increase of eight per cent.

State University at Leyden

Opening o fthe Rheumatological Laboratory

The silver jubilee of the Leyden Rheumatological Clinic on May 23 last coincided with the official opening of this foundation's new rheumatological laboratory, containing the very latest equipment for academic research on rheumatism. At the inaugural ceremony the American Ambassador presented the foundation with a gift of 30,000 guilders, donated by the United States Public Health Service and the Helen Hay Whitney Foundation. Dr. A. Querido, professor of Metabolic diseases and endocrinology, delivered an address (printed elsewhere in this issue) in which he posed the question as to whether medical research should be looked upon as a luxury in the Netherlands — a question to which he replied in the negative. There was also an address by Dr. J. Goslings, professor of rheumatology and director of the clinic.

The new building comprises twenty rooms, divided into two main departments. The first department covers histology and histogenetics and has at its disposal an electronic microscope capable of magnifying objects to 80,000 times their actual size. The other is the immunological and bacteriological department, in which research is carried out on the causes and the diagnosis of rheumatism.

State University at Groningen

69th Anniversary Celebrations

The 69th anniversary of the founding of Groningen University was celebrated from June 13 to 26 last amid scenes of great festivity. Highlights were the visit of H.M. Queen Juliana on June 25, and the opening, on June 22, of the "Corps Week" for members and old members of the Students' Union, "Vindicat Atque Polit," on which occasion the main speech of the day was delivered by His Excellency, the Dutch Ambassador, Head of the Combined Permanent Netherlands Mission in Paris and Rector of the Union Senate in 1919, Mr.[1] D. U. Stikker.

On November 26, 1612, the Dutch *Staten van Stad en Lande* (Towns and Provincial Parliament) decided upon the establishment of a university in Groningen, which was officially inaugurated on August 23, 1614, being originally housed in a number of monastery buildings. In 1846 these premises were demolished and replaced by a new building, which, however ,was burned to the ground in 1906. The present premises were erected in 1909. Originally a provincial institution, the university became a state university after the restoration of national independence in 1813. It led an extremely flourishing existence in the 17th century, reaching heights never again attained during the 18th. A period of steady expansion set in after 1876, however, the year in which the Higher Education Act was passed in the Netherlands. The number of students registered at the university has gradually increased, this increase being particularly marked in the post-1945 period. Whereas in the academic year 1924/25 1,000 students were registered there, today the number has almost reached the 3,000 mark.

State University at Utrecht

Over One Thousand New Students

In the period September 1, 1958 to April 1, 1959, 1,151 new students have registered at Utrecht University, of which 1,049 had not previously been registered at any other university. The number includes 279 women students, or 24% of the total.

Extension to the Spanish, Portuguese and Ibero-American Institute

Prince Bernhard, president of the Institute, performed the official opening ceremony of the new Portuguese-Brazilian department of the Institute on May 13 last, in the presence of the Spanish and Portuguese Ambassadors and representatives of almost all the states of South America. The Brazilian Ambassador, Dr. J. de Sousa-Leao, presented the Institute with an engraving dating from the year 1818, a portrait of King John VI, who was proclaimed king of the United Kingdom of Portugal, Brazil and Algarve in 1816 and who did much for culture in Brazil.

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[1] Netherlands academic title: Master of Law.

On June 13 the Minister of Foreign Affairs of Honduras paid a visit to the Institute, presenting it with a portrait of Francisco Morazán (1792-1842), one of the greatest heroes of the Central American struggle for liberation, and also with a number of publications from his country.

Free (Reformed) University of Amsterdam

Calvin Commemoration

On May 22 last, the Senate of the Free (Reformed) University of Amsterdam held a public session in the Westduin Church at Amsterdam at which Calvin's anniversary and the foundation of his academy at Geneva were commemorated. Speakers at this meeting, which formed part of the general programme of commemoration, were Dr. D. Nauta, professor of theology, and Dr. H. Smitskamp, professor of history.

Civitas Days

The subject to be treated during the "civitas" days organized by the Free University and to be held this year at the conference centre at Woudschoten from September 2 to 5, will be: The Free University and the Public University. Introductory speakers will be Professor H. Kraemer, who will speak on the public university, and Professor Dooyeweerd, who will discuss the free university. Professor P. Mullender will talk on the idea of academic citizenship.

Roman Catholic University at Nymegen

University Council Formed

Last May a University Council was set up at the Roman Catholic University at Nymegen, consisting of six professors, six students and three members of the scientific staff, while the Rector Magnificus, the president of the Students' Union, one of the moderators and the students' deans also have seats.

The Council's aim is to foster solidarity and co-operation among all members of the academic community and to do all that can be done to contribute to its well-being; further, to act as a stimulus to the university in performing its creative and critical function in society. The Council is not a policy-making body but will have to acquire prestige by appropriate handling of urgent problems existing within the university community, which is reflected in the choice of the Council's members on the basis of personal qualities.

Similar councils already exist at Leyden University and at the Free (Reformed) University at Amsterdam.

Technological University at Delft

Over 6,000 Students Enrolled

According to data assembled last May, 6,143 students have been enrolled at the Technological University at Delft during the current academic year, as compared with the 5,809 enrolled the previous year. No less than 1,153 were enrolled for the first time.

Once again this year the largest number of enrolments were in the department of mechanical engineering, the figure being 1,246. Electrotechnics and chemical technology also increased their number of enrolments, despite the fact that these subjects are also being taught nowadays at the Technological University at Eindhoven (as is mechanical engineering too).

Netherlands School of Economics at Rotterdam

3,000 Sudents in 1970?

At the request of the Ministry of Education, Arts and Sciences, the Netherlands School of Economics has drawn up an investment programme for the period from the present to 1970. The plan is based on an anticipated increase in the number of students up to 2,400, though the possibility of an increase up to 3,000 must be reckoned with. This expansion makes necessary a number of special provisions, such as the extension of the teaching staff and of existing accommodation. 1,558 students were enrolled in 1958.

New Subject: Harbour Economics

A new subject, Harbour Economics, has been introduced at the School of Economics. Mr. B. J. Udink, secretary of the Rotterdam Chamber of Commerce, has been appointed as part-time lecturer in this subject. The title of Mr. Uding's inaugural lecture was "Some Aspects of the Position of the Maritime Harbours in the European Economic Community."

RESEARCH

The Organization for Industrial Research T.N.O. and Netherlands Industry in the Period 1934 - 1959

Last May the *Organization for Industrial Research T.N.O.*, first of the T.N.O. Central Organization's special organizations, founded in 1934, celebrated its silver jubilee. The past twenty-five years of the Organization's existence may be roughly divided into three phases: the period, 1934–1940, during which the Organization was fighting to secure recognition for the work it was doing; the war years, 1940–1945, an interim period during which further preparations were made for its future work; and the post-war period, a time of consolidation and expansion.

During the celebration of the organization's jubilee, Dr. J. Hamaker, director of the *Central Technical Institute T.N.O.*, delivered a speech on the work the *Organization for Industrial Research* is doing for Netherlands industry, from which the following observations have been selected.

We can liken the activity of the *Organization for Industrial Research T.N.O.* to that of an army advancing against the foe, an advance in which a few break-throughs can be of the greatest importance to final victory, yet the ultimate success of which is inconceivable, unless the rest of the army follows the shock troops' advance, making a little headway every day.

Carrying this image further, and mentioning a name – Tobruk – familiar to us all from the last World War, I should like to mention. that today drinking water is being distributed in Tobruk produced from a brackish source with the use of apparatus constructed under licence from one of the *Organization for Industrial Research's* patents. And that water meets the requirements. The King of Libya has tasted it and declared it to be good: it will be laid on to his own palace.

The same country is struggling not only with a shortage of water but with a surplus of dates too. Through the intermediary of the F.A.O., the *Central Technical Institute T.N.O.* was commissioned to try to produce from these dates a syrup which could be used either as a supplementary food in the country's schools or as raw material in the bakeries. The attempt has been crowned with success: a good date-syrup has been manufactured and a sample shipped to Libya, where it has been declared very "tasty." A Netherlands industrial firm will now be delivering a plant to provide for the production of several hundred tons of syrup per annum.

The two examples I have just mentioned fall, however, outside the scope of the gradual, step-by-step improvement of technical achievements in industry, which is striving all along the line to produce cheaper and better products than those being produced at present. This word "better" immediately introduces the matter of quality, from which it follows that great attention must be paid to judging quality.

When a consignment of durable household gadgets, such as we manufacture in our country, is exported overseas, it sometimes happens that a large number of them arrive at the importer's in a damaged condition. The packaging was not able to stand up to the handling these goods received in some ports and warehouses, although it did meet Dutch requirements. It was only after the *Package Research Centre T.N.O.* had made tests to see whether the apparatus, when packed, could fall from a height of twenty feet without becoming damaged, that there was a big reduction in the percentage of goods arriving damaged.

In this case the example given is fairly evident — we can imagine that in other parts of the world they just let the crates drop as soon as they were hanging over the unloading quay! But the matter is not always as simple as this — sometimes it is difficult to say precisely what factors determine the quality of the goods delivered. And in this case it is necessary to study matters prior to the final check on quality. An illustration of this is provided by the co-operation lent by the *Institute for Fire Prevention T.N.O.* in arriving at a method of testing fire precautions with relation to oil-burning stoves. An inquiry of this kind was necessary, because the manufacturers, importers, wholesalers and retailers had come to terms on the foundaiton of a body — the Oil Stoves Fire Precaution Requirements Foundation — which since January this year has been issuing certicates in respect of all approved oil stoves put on the market. The requirements as to quality this foundation sets are the result of years of research, which is still being pursued in order to extend and improve these requirements, and the *Organization for Industrial Research's Institute* *for Fire Prevention* is continuing to lend its co-operation on this work.

In our opinion one must not ask whether such work benefits the consumer. The distinction we make between consumer and producer seems to divide our society, somewhat invidiously, into two camps, which are really one and indivisible. Our one hand spends money as a consumer — but our other is busy earning it, as a producer. The amount of money that finds its way into the receiving hand at the end of the week or month is, in the last resort, determined by the amount the producer of goods and services for our nation has succeeded in earning. And if we work to strengthen our nation's position, we all share in the resulting benefit, as consumers too. The raising of the standard of the goods we produce, however this may be achieved, is consequently in the interest of us all.

We can ask ourselves whether in talking of "our nation" or "our community" here, we ought not to say "our European community" instead. We shall be agreed that this is going rather far, since the theoretical acceptance of the need for co-operation has yet to be transformed into practical co-operation on an adequate scale. And yet this emergent European community is already affecting our work, including the work of determining quality. It is not inconceivable that, after we have got rid of tariff walls, we should strike against another form of trade barrier — the technical certification of apparatus and machines, which may possibly hamper the free exchange of goods. It is fortunate, therefore, that consultations are being undertaken in this field too. Moreover, in the cases we are familiar with, it is the manufacturers who initiate this European consultation on the determination of quality. This in itself is a gratifying sign that European co-operation is developing more rapidly than some people imagine; and it also happens to be work in which the *Organization for Industrial Research T.N.O.* is playing a rôle. In order to arrive at a single standard, it is necessary to compare the different methods of testing employed. This is useful, but difficult, work.

In addition, we very often pay to the improvement of manufacturing technique, and here, too, it may be a case of improvements which will reduce production costs or of improvements which will result in better products — which may mean, among other things, goods more constant in quality.

In recent years the *Leather Research Institute T.N.O.* at Waalwijk has been experimenting to see whether in tanning sole-leather the loss of vegetable tanning matter can be limited without having a deleterious affect on the quality of the leather. This can be done, and if the firms concerned take the necessary measures, the present loss of from 20% to 30% can be reduced to about 10%. This work has required a number of years for its completion and the results have been recorded in a set of five reports, containing advice on the dissolving of the tanning matter, the dilution of this solution and many other points — themselves mere details, but adding up to a great saving. Tanning matter imports cost the Netherlands about five million guilders a year: we can save a million by employing the economy measures now discovered.

The improvement of existing techniques also includes improving the quality of our homes. Let us restrict ourselves here to the windows, doors and floors made of wood. Everyone knows how the timber used for doors and windows can warp or contract or is so damp at the time of construction that the first coat of paint stays on for a far shorter period than it might. It is a source of daily vexation to many, and what is perhaps worse: it costs us all money. Maintenance costs are higher than is necessary and in the wintertime the warmth flies out through the cracks.

A large part of the difficulty comes from the wood being too damp. In former times we obtained good quality timber by storing it over a long period either in water or out-of-doors. The task of making up the building shortage after the war no longer leaves us sufficient time to get the wood into good condition before it is used for building. But an improvement can be brought about by employing a system of artificial drying. The *Forest Products Research Institute T.N.O.* has devoted a great deal of attention to this subject. Its work included the determination of the drying process necessary for each type of timber and how this could be effected in existing or new dryers. The drying process amounts to the changes in the temperature and humidity of the (drying) air required during the drying process. The dryers constructed on the basis of the indications the T.N.O. has furnished satisfy all the technical requirements. But the reporting of difficulties and the indication of a solution are not always sufficient to bring about an improvement. The trouble here is the unfavourable post-war situation: owing to great building activity, the demand for wood remains high, and in such a market people are not choosy. *The Forest Products Research Institute T.N.O.* therefore has to go a step further. It points out clearly the results of building with wood that has not been dried sufficiently. For this purpose an electric humidity meter has been evolved which makes it possible to determine the humidity content of wood in a window-frame or a floor. Of 500 houses tested in this way in Leyden, 200 proved to have rotting floors as a result of the wood being too damp.

So we now know that drying is necessary; we know what the dryers must do; we know how such dryers must be constructed. And yet the Institute still felt it should go a step further. A dryer for practical use is now under construction in order that we can give young people practical training in the art of drying timber — a drying school, that is to say. An example of this kind shows how far we sometimes have to go in order to get improvements applied in practice.

The word "school" leads me to speak next of the *Plastics Research Institute T.N.O.*, which has not only devoted attention over the years to the manufacture of plastic materials but has also taken a constant interest in their processing and application. It is not for nothing, therefore, that this institute also has an active part in the training of plumbers and fitters, who have to learn how to use plastic pipes.

Following on these examples of improving techniques in order to produce goods of better quality or to raise production methods to a higher level of efficiency, I should like to say something about new production.

The pilot's dinghy of glass-fibre polyester made by the *Plastics Research Institute T.N.O.* for the Navy is already well-known. But only a short time ago we heard that this dinghy is still rendering such good service, after prolonged use under the highly demanding conditions encountered in the work of piloting, that a series of such boats now has to be built. This is not, of course, a job for the T.N.O. at this stage — the commission will go to industry. In this same context I can announce that a lifeboat for 60 persons developed by the T.N.O., working together with an industrial firm, has also led to subsequent orders.

It is not only plastic materials reinforced with glass-fibre which enable us to construct large plastic apparatus. These can also be constructed with a sort of honey-comb material, made of paper, impregnated and finished with plastic material. A swivelling garage door has been developed, made out of this material. The practical knowledge required for its manufacture was supplied to the firm concerned by seconding one of the Institute's staff to the factory when the first models were being made. These doors are now in regular production.

New materials create new possibilities, old materials sometimes lose their market and create new problems. It was this kind of problem that instigated a large-scale inquiry carried out to discover new fields in which *starch* could be employed. Although very little publicity has been given to this matter in the past, it is worth while pointing out that we have succeeded in splitting this material, officially known as amylum, into amylose and amylopectine, both of which are being used in industry. A firm exists in the north of the Netherlands which has been engaged for some time now — and with success — on the splitting of starch on an industrial scale.

A word about the de-salting of water by electro-dialysis. The entire development in this field and the first technical results were achieved by the use of a kind of selective membrane which we made at the *Plastics Research Institute T.N.O.*, by mixing ion-mutators milled in the *Central Technical Institute T.N.O.* with polythene and rolling out this mixture into thin sheets on calenders. Working in collaboration with the *Central Laboratory T.N.O.*, the Institute has developed a type we can now produce in rolls of 50 metres by 1 metre. They are the finest membranes obtainable anywhere in the world at the moment. As soon as the trial production stage has been passed, this method of manufacture will also be handed over to Netherlands industry.

I have sought by this last example to show that our different institutes do not work in isolation: they continue to gather strength by aiding one another through increasing co-operation.

Summarizing, I would say that there now exists a group of technicians who are assisting Netherlands industry in its technical advance. Much of the work they have done, and are doing, is done in order that we may advance one short step, but all these short steps put together are undoubtedly just as important as one big success — and the big successes are not lacking either!

INSTITUTIONS

Research At and Under the Auspices of the Royal Tropical Institute

I *Composition and properties of sweet potatoes*

On the initiative of Dr. H. A. P. C. Oomen of the Royal Tropical Institute's Department of Tropical Hygiene and Geographical Pathology, a series of investigations has been embarked upon in co-operation with the Institute's Department of Tropical Products, to determine the composition of the sweet potato in Netherlands New Guinea, with special reference to its protein content and the properties of these proteins. The Agronomical Section of the Experimental Station at Kota Nica (New Guinea) is undertaking the sampling and the care and handling of the samples.
The Harald Quintus Bosz Fund in the Netherlands has made a grant of 4,000 guilders (roughly £ 400 or just over $ 1,000) available for this research.

II *Phosphates in tropical soils*

The Netherlands Organization for the Advancement of Pure Research (Z.W.O.) is subsidizing a study of phosphates in tropical soils. The basic research will be carried out in the Royal Tropical Institute at Amsterdam under the supervision of Professor F. A. van Baren in the Institute's Soils Laboratory. Subsequent, specialized research with phosphate isotopes will be performed in the Agricultural Chemistry Laboratory at the Agricultural University at Wageningen, under Professor A. C. Schuffelen's supervision.

Institute for the Application of Atomic Energy in Agriculture (I.T.A.L.)

A beginning has been made in Wageningen on the construction of a laboratory with a nuclear reactor for use by the I.T.A.L., founded last year. This will be the first nuclear reactor specially designed for the purposes of agricultural research. Atomic energy is, it is true, already being applied in agricultural research in Belgium, Western Germany, Denmark, Sweden, Norway and Great Britain among other countries, though only as part of general research.
Large quantities of radio-isotopes and sources of intense radiation are being concentrated in the I.T.A.L. laboratory, which will, it is hoped, be ready by 1961.
Special precautionary measures make it possible for specialists to carry out dangerous research work which cannot be done in other agricultural institutes, several of which, however, have plans for using atomic energy on a smaller scale in their research work.

The research done by the I.T.A.L. is in general concerned with the application of radio-isotopes to the soil, plants and animals. It has been found out that ionizing rays generated by radio-active materials are capable of influencing reactions and thereby the life-processes in the living plant or animal, while certain reactions can also be produced in dead matter. In certain circumstances ionizing rays can also have a preservative influence. Mutation refining and food preservation accordingly number among the main items on the I.T.A.L.'s research programme.

Dr. T. J. Barendregt, at the moment still temporarily attached to the Atomic Energy plant in Kjeller, Norway, will become the director of the I.T.A.L. The Deputy Director is Dr. Ir. D. de Zeeuw, who has worked for two and a half years in the experimental nursery radiated with radio-active cobalt belonging to the National Laboratory at Brookhaven on Long Island, New York. The I.T.A.L.'s task also covers the lending of services to other institutes and laboratories and the training of research workers and assistants. Dr. de Zeeuw is already giving courses in the use of atomic energy to biologists and agriculturists and is working with small quantities of radio-isotopes in the I.T.A.L.'s temporary laboratory, housed in the new premises of the Agricultural Chemistry Laboratory of the university at Wageningen.

In 1955 Dr. A. C. Schuffelen, professor of agricultural chemistry in the Agricultural University, reported to the Minister of Agriculture that Wageningen should have a nuclear reactor put at its disposal, if it were not to fall behind other universities abroad in the field of agricultural research. After the submission of this report a beginning was made with the preliminary paper work for the Wageningen reactor and the foundation of the I.T.A.L.

LIBRARIES AND MUSEUMS

The Royal Library at The Hague

Although not a university library, the Royal Library at The Hague is closely concerned with scientific work — and therefore with university life — in the Netherlands by virtue of the place it occupies in the Dutch library world and the function it fulfils there. The organization of the Netherlands libraries has not been imposed on them from above but has resulted from voluntary co-operation, and it is this co-operation (in which the Royal Library joins and which to an extent has come about due to its initiative) that has conferred upon it its special, central position, so that we have some justification for regarding it as our National Library. But this, strictly speaking, it is not.

The fact that is has not become the National Library of the Netherlands was due to chance circumstances rather than to the library's historical origins, though it may be that its comparatively late foundation bore some influence in this respect. It was in 1798 that the collection of books Stadholder Willem V had left behind him on his flight to England in 1795 became known as the National Library. But at this juncture it was still an official library only, at the exclusive disposal of parliament and the ministries. Later, during the rule of Louis Napoleon (1806-1810), who founded so many of our present arts and sciences institutions or gave them a national allure, it did, however, become a national library in the modern sense of the word, being then known as the Royal Library. In this period, as also during the days of the Batavian Republic, it even became a depository for all matter printed or published in the Kingdom of Holland. After the rapid expansion it had seen in Louis Napoleon's reign (the Romswinckel Collection forming the foundations of its section on the nation's history and the Visser Collection doing the same for its collection of *incunabula)* there followed a period of stagnation, succeeded, in what was now the Kingdom of the Netherlands, by another period of flowering under Willem I. Important collections were added during this phase, such as that derived from the books remaining in the former Belgian monastery of Tongerloo and part of the library of Castle Dillenburg, family home of the Oranges.

These acquisitions necessitated larger premises so that in 1819 the stately 18th-century house along Lange Voorhout, which still forms part of the library's premises todays, was taken over. The ideal of forming a general academic library still existed at the time, but there was not the slightest chance of achieving this on the extremely limited funds at the library's disposal. Accordingly Thorbecke, the celebrated 19th-century minister, wished all purchases to be confined to books on political science, with a view primarily to the requirements of the two houses of parliament and the ministries — a reversion, that was, to some extent, to the library's original function. Later on, however, the library was allowed greater freedom once more, probably because the Lower House had obtained a library of its own in the meantime.

It was not until the last quarter of the 19th century, however, that the field covered by the Royal Library, still confined to the humanities, was definitely extended, accompanied by a considerable increase in its budget. During the 20th century the frontiers have been gradually extended still further so that today, subject to a few restrictions, the library covers the entire field of the humanities. The idea of a library of general scope had rightly been abandoned a long time before: in our small country it is better to leave provision for the pure sciences to the universities, while, on the other hand, by restricting itself to its own field, the Royal Library was able to come nearer to completeness.

The wisdom of this is apparent from the expansion the library has shown during the century and a half it has been in existence. Having begun in 1798 as a collection of about 5,000 volumes, it now has almost 800,000. In 1908 it acquired a new building, which houses the present reading room, and in 1956 part of a new extension was taken over, that, when complete, will provide storage space for one million volumes. It had proved all the easier to abandon the idea of a general library because there is no law in the Netherlands which provides that copies of all books, magazines and newspapers printed or published in the country must be deposited in a library. The task of preserving such matter, cataloguing it and placing it at the reader's disposal usually falls to the National Library, automatically conferring on it the character of a general library, at least as far as home book production is concerned. Such a library usually takes charge too of the compilation of a national bibliography, though there was less need for this in the Netherlands, since a bibliography was provided, satisfying reasonable demands, by the bookselling trade. Apart from Belgium, therefore, the Netherlands is the only country in Europe which still has no *dépôt légal*, to use the French term.

It would not be right, however, to deny the Royal Library the title of National Library on these grounds. First there is its large collection, typical to a certain degree of a national library. Its manuscript department is remarkable for the large number of mediaeval examples of Netherlands origin it contains and for the many manuscripts connected with the nation's history and literature. Among Dutch academic libraries, it has the largest collection of *incunabula* printed in the Northern and Southern Netherlands and of early 16th-century Dutch editions. Its collection of old Dutch publications dating from the 17th and 18th centuries is also extensive and is being constantly expanded. And it is the only academic library in the Netherlands which purchases Dutch publications in the field of *belles lettres* on a large scale.

It became apparent during the discussions at the National Libraries Symposium, held in Vienna in September 1958, that the divergent nature of the different national libraries renders it extremely difficult to arrive at a precise definition of what constitutes a national library. The conclusion was that the national library not only has a typically national task to perform in building up its collection, but that it differs from other academic libraries in that it makes collections which, though not unacademic, are of a highly diverse and special character. The Royal Library at The Hague certainly meets these requirements.

With its collection of Dutch song-books, Dutch folklore books and its chess library, second only in size to that of the Public Library at Cleveland, it is far ahead of the other Netherlands libraries. It is also distinguished for its extensive collection of works concerning Joan of Arc, Dante, falconry, graphology and animal psychology, while its collection of modern French literature in numbered editions, most of them bearing inscriptions by their authors, must be entirely unique.

This last-mentioned collection is typical of another of the Royal Library's activities, namely, the collecting of books as *objets d'art*. It is in the possession of representative collections of illuminated manuscripts and historical bindings, while the acquisition some years back of the Radermacher Schorer bequest provided foundation and form to its collection in the field of modern typography. The Royal Library enjoys the privilege of having a museum — the Meermanno-Westreenianum Museum — under its direction, outstanding among museums for its collection of illuminated manuscripts and *incunabula*, and destined shortly to be expanded into a Book Museum, a move that will provide the Royal Library with an opportunity to put its many treasures on display. All the same the central position it occupies in the Netherlands library world does even more than its collection to confer on the Royal Library the character of a national library. It possesses a union catalogue department, the largest of which comprises about 2½ million titles, recording the books in the possession of more than sixty libraries. A second union catalogue, comprising the titles of over 200 libraries, is confined to periodicals. The possession of these catalogues has made the Royal Library the centre of the library loans system, which has assumed very large proportions in the Netherlands. In 1958 the union catalogue service dealt with more than 125,000 written requests for loans of books, so that gradually it has become necessary to reckon with an average of 500 requests per day. This loan service makes it possible for students living in small villages which have no libraries of their own to obtain books from any of the libraries covered by the union catalogues. There are not many countries in which such a service on such a scale is provided for the use of private individuals. And the service is further supplemented by the work of the Royal Library's photographic department, which supplies reproductions of literature in the form of microfilms, photo-copies or *microfiches*.

Another department which gives the library a central function to perform is that of the international exchange service. This service acts as an intermediary for the despatch of publications by universities and learned societies in exchange for similar writings from bodies abroad. The department also exchanges publications issued by the Netherlands government (of which it receives five copies of each) for foreign publications, this service being provided for the benefit of ministries and other official and academic authorities.

Finally, the co-operation which takes place between academic libraries in the Netherlands is also demonstrated by the work of the National Libraries Advisory Committee, of which the director of the Royal Library is *ex officio* chairman and the librarians of the State Universities, the Technological and the Agricultural Universities are members in virtue of their office too. Librarians from other libraries occupy the remaining seats on the committee, which not only furnishes advice to the authorities, but is also the body via which a large part of the inter-library co-operation functions.

L. BRUMMEL *)

INTERNATIONAL SCIENTIFIC MEETINGS

Annual General Meeting of the International Academic Union

Last June the *Union Académique Internationale* held its annual general meeting at Noordwijk, the Netherlands. The Science Academies of a large number of countries are members of the Union in so far as they concern themselves with the humanities. The meeting was attended by representatives of the academies in Austria, Belgium, Canada, Czechoslovakia, Denmark, Finland, France, Germany, Great Britain, Greece, Hungary, Italy, Japan, the Netherlands, Norway, Poland, Rumania, Spain, Sweden, Switzerland and the United States, and also by delegates from UNESCO and the *Conseil de la Philosophie et des Sciences Humaines,* a central organization, set up by UNESCO, for academic bodies working in the field of the humanities.

One of the important topics discussed was the question as to the place the U.A.L. must occupy and the task it must perform in a broader context of international co-operation.

Third World Congress on Fertility and Sterility

The International Fertility Association held its third world congress in Amsterdam from June 7 to June 13 last. The congress was attended by no less than 800 doctors, biologists and veterinary surgeons from the entire western world and from many non-European countries.

In a resolution adopted on the last day of the congress, the principal aim of the Association was defined as being the fostering of improved relations among the nations by the exchange of knowledge which can help to preserve family life.

A further resolution stated that radio-activity must be regarded as a threat to the propagation of the human species.

The I.F.A. will devote itself to the full and careful development of new methods of diagnosing and treating sterility.

Finally, it was posited that it is of the greatest importance that good clinical faciliies should be made available for the detection and treatment of sterility.

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* Dr L. Brummel is Director of the Royal Library at the Hague.

MISCELLANEOUS

Two Honorary Doctorates for Professor Geyl

Professor P. Geyl, on whose departure as professor of history from the State University at Utrecht we reported in Vol. II, No. 3 of this bulletin, was awarded the honorary degree of Doctor of Literature by Harvard University on June 11 last, this being followed by the award of a further honorary doctorate by Oxford University, England, on June 24.

At Harvard Professor Geyl delivered an address on the problems involved in European integration. This was the sixth occasion that the professor has visited the United States since the war. On previous occasions he has acted as guest lecturer at various universities, among them Princeton, Harvard, Yale and Stanford. Several of his works have appeared in English.

New Foreign Members of the Royal Academy

The nomination of the scholars von Frisch, Néel and Plessner as foreign members of the Royal Netherlands Academy of Sciences and Letters has been confirmed by royal decree.

Dr. K. von Frisch was born in Vienna in 1886 and studied medicine and zoology. In 1921 he became a professor of zoology, teaching the subject in Rostock, Breslau and Munich successively. His special field is neuro-physiology and animal behaviour connected with the organs of sense. He is to be regarded as one of the most eminent zoologists of the last twenty-five years.

Dr. L. Néel is continuing the great French tradition of research on magnetic matter, instituted by Curie, Langevin and Weiss, in worthy fashion. Director of the Physics Laboratory and of the Technological University at Grenoble, Dr. Néel has predicted and interpreted the ferri-magnetic behaviour of the ferrites and garnates, thereby contributing greatly to the development of the technical uses to which these new classes of magnetic metals are put.

Dr. H. Plessner is professor of philosophy in the University of Göttingen and former professor of sociology and philosophy in the State University at Groningen, the Netherlands. He lived in our country from 1933 to 1950, performing important research in the borderlands between philosophy, psychology, biology and sociology.

Professor Waterman's Departure from Delft

After a 40-year long career as professor of chemical technology Professor H. I. Waterman said farewell to the Technological University at Delft on June 26 last. In his inaugural lecture he had already expressed the view that "any chemical industry is doomed if it does not maintain constant links with scientific research," and it is therefore no mere chance that the rise of the chemical industry in the Netherlands coincided with Professor Waterman's work as a professor. He discovered mutations in moulds, an inquiry with which he took his degree in 1913; he introduced "ring-analysis" for research on mixtures of carburetted hydrogen and in 1932 developed "molecular distillation," employed on a large scale nowadays for the concentration and distillation of vitamins A, D and E, among other things.

Another important aspect of his work has been the efficacious co-operation he has built up with other departments of the Technological University, in particular with the department of mechanical engineering. His organization of chemico-technical research has attracted attention in places far removed from the Netherlands, as has been witnessed by the numerous visitors who have come from abroad to personally acquaint themselves with the results achieved by co-operation of this kind. He also sought to build up links with the building department, which he succeeded in doing with his research into the structure of asphalt and his analysis of cement and glass.

Professor Waterman's original mind and spirit and his enormous industry have made a deep impression on his students, no less than 69 of whom he has presented for their doctor's degrees in the technical sciences. He is an honorary member of the Institute of Petroleum and of the *Société de Chimie Industrielle,* and has been awarded the medal of the universities of Nancy and Louvain.

Tribute to Professor François

On July 5 last, Professor J. P. A. François, Secretary-General of the Permanent Court of Arbitration in the Peace Palace at The Hague and professor extraordinarius of international law at the School of Economics at Rotterdam, received a special mark of tribute from his friends on the occasion of his 70th birthday. This anniversary prompted the editors of the Netherlands Journal of International Law, founded towards the end of 1953, to dedicate its July, 1959 number to this Dutch scholar of international law. Among the 35 contributions to this special number are a number written by practically all Dutchmen of reputation in this field, while the contributions by scholars abroad include those by Lord McNair, Georges Scelle, Alfred Verdross, Charles de Visscher and Quincy Wright. About three-quarters of the articles are in English or French, the others being provided with a short summary in one or other of these languages.[1]

During the festive celebrations of the occasion a handsome edition of this number was presented to the professor by his colleague, Professor W. J. M. Eysinga, former judge of the International Court of Justice, who forty years ago had presented Professor François for his doctor's degree.

Professor ten Doesschate's Inaugural Address

On July 1 last, Professor J. ten Doesschate, newly appointed to the chair of Ophthalmology at the State University of Utrecht and successor to Professor H. J. M. Weve as director of the Utrecht Ophthalmological Hospital, delivered his inaugural lecture, entitled "Ad Von Helmholz Paralipomena," Hermann von Helmholz's *Handbuch der Physiologische Optik* (1856-1863) is still able to serve research workers as a basis for their study, said the professor. His observations on the geometric optics of the eye and the accommodation mechanism have retained the greater part of their value to us, though in other fields ophthalmology has struck off down entirely new paths. The development of photochemistry of the retinal pigments has led to photochemical theories of sight that have culminated in the Hecht theory. Thanks to electro-physiology, the retina has come to be regarded as a complicated electronic apparatus. Our thinking has undergone important changes as a result of the application of quantum-statistical observations in interpreting visual phenomena, Netherlands research scientists like de Vries and van den Velden Bouman having had a great share in this. Finally, the "Gestalts" psychologists and modern American psychologists have performed pioneer work in bringing about a change in our views regarding the psychology of sight.

Death of Professor Fritz Kögl

Dr. Fritz Kögl, professor of organic chemistry and biochemistry in the State University at Utrecht, died on June 6 last.

Professor Kögl, who reached the age of 61, was born in Munich, in which city he studied and took his degree. Between 1920 and 1926 he worked as assistant to the professors Wieland and Fischer and was also private tutor for some years at the Technological University at Munich. In 1926 he was appointed to the post of head of the laboratory in Göttingen University, becoming a professor at Utrecht in 1939. His principal works were concerned with vegetable hormones and the chemistry of proteins. Professor Kögl was an honorary member of the *Consejo Superior de investigaciones Cientificas* at Madrid and holder of the Emil Fischer Medal.

Departure of Professor van Asbeck

Having reached retirement age, Professor Mr. F. M. Baron van Asbeck will be laying down his duties as professor of international law and international diplomatic history in the State University at Leyden as from September 21.

Baron van Asbeck studied at Leyden, obtaining his doctor's degree with a dissertation entitled "Enquiry into a World Legal Structure," an early indication of where his interests lay. In 1919 he joined the Netherlands delegation to the "Conference of Neutrals" at the Versailles Peace Talks. Later on he entered the government service in the former Netherlands East Indies, where he rose to the position of government secretary. In 1925 he became professor extraordinarius in international law and overseas colonial law at the College of Law founded in that year at Batavia (now Jakarta), and in 1939 followed his appointment as professor of comparative colonial constitutional law at Leyden. He has occupied the chair of international law and of international political history at this university since 1945.

Professor van Asbeck has been a member of the Permanent Mandates Commission of the League of Nations and of the Permanent Court of Arbitrage, and also of numerous other bodies and organizations in the field of international law. Mention of his recent appointment to the European Court for the Rights of Man was made in Vol. III, No. 1 of this bulletin.

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[1] Published by A. W. Sijthoff Ltd., Leyden.

On May 28 last he delivered his farewell lecture in the auditorium at the "Gravensteen" in Leyden, during which he spoke on the growth of international law, laying emphasis on the fact that the supremacy of "transnational" law is now recognized in many constitutions and that the former principle of "voluntariness" and independence has been discarded or toned down, while the principle of disinterestedness has been reinforced.

Foreign Distinctions for Netherlands Astronomers

Professor J. H. Oort, professor of astronomy in the State University at Leyden, was elected a member of the Royal Society (London) in April last.

The American Academy of Arts and Letters has appointed Professor M. G. J. Minnaert, professor of astronomy in the State University at Utrecht, as an honorary member of the Academy.

English Version of Radiotelescopy Film

Herman Kleibrink, observer at the Leyden Observatory, who has acquired a reputation as an amateur maker of films with various films on natural life, has been commissioned by the Ministry of Education, Arts and Sciences to make an English version of his 1955 film on the Radio Telescope at Dwingeloo, which also gives a picture of similar observatories in Canada, India and the United States. A description of the station at Dwingeloo will be found in the article by Professor van de Hulst in the present issue.

Professor Schacht off to America

Dr. J. Schacht, professor of Arabic in the State University at Leyden, will be exchanging this chair for one in Arabic and Islamic Science at Columbia University in the United States, after a stay of five years at Leyden.

Professor Schacht is of German nationality, having left his country in 1933, when the National Socialists came to power. He taught in Cairo, Oxford and Algiers before taking up his appointment at Leyden in 1954.

Pair of Netherlands Geologists off to the Andes

Professor C. G. Egeler, professor of general geology in the University of Amsterdam and Dr. T. de Booy, curator of the Geological Institute in that city, will be undertaking another expedition this year to Southern Peru for geological investigations in the Andes. The expedition will be financed by the Z.W.O. (Netherlands Organization for the Advancement of Pure Research). Both geologists made similar expeditions to Peru in 1952 and 1956; both are experienced Alpine climbers and in 1952 ascended to the top of Mount Huantson (20,987 ft.), then the highest peak in the Andes not yet climbed. They hope some time in the future to make an expedition to the Karakoram.

American Prize for Netherlands Neurologist

Dr. J. P. Schade, leader of the electrophysiology department of the Netherlands Central Institute for Brain Research (see Vol. III, No. 1 of our bulletin) has been awarded the American Dr. A. A. E. Bennet Prize, a prize awarded every five years by the American Society of Biological Physiology for the best scientific work done on the theoretical foundations of our knowledge of the nervous system.

Dr. Schade, now 28 years old, has opened up a new branch of neurological science in his work: research into the electric characteristics of the nervous system, seen in relation to the latest discoveries regarding its structure. This research was carried out at the Amsterdam Brain Institute and pursued further by Dr. Schade during a period of eighteen months spent in Pasadena, U.S.A., where he worked as a guest at the California Institute of Technology.

Brussels Appointment for Professor van Stuijvenberg

Dr. J. H. van Stuijvenberg, professor of economic and social history at the Netherlands School of Economics at Rotterdam, has been appointed professor extraordinarius of economic history from the 18th century onwards at the Free University at Brussels. The appointment may be seen as an expression of the desire to develop teaching in the two Belgian languages (French and Flemish) at this university. Professor van Stuijvenberg will be delivering his lectures in the Dutch (Flemish) language.

DOCTORAL DISSERTATIONS

Theology

BIJLEFELD, WILLEM ABRAHAM. *De Islam als na-Christelijke religie. Een onderzoek naar de theologische beoordeling van de Islam, in het bijzonder in de twintigste eeuw.* (Islam as a Post-Christian Religion. An inquiry into the theological evaluation of Islam, mainly in the 20th century). The Hague, 1959.
With a summary in English.
State University at Utrecht.

HEIDEMAN, EUGENE PAUL. *The Relation of Revelation and Reason in E. Brunner and H. Bavinck.* Assen, 1959.
State University at Utrecht.

HUGEN, MELVIN DALE. *The Church's Ministry to the Older Unmarried.* Kampen, 1959.
Free (Reformed) University of Amsterdam.

PAUL, GERRIT JAN. *Schepping en Koninkrijk. Een studie over de theologie van Dr. O. Noordmans.* (Creation and Kingdom. A study of Dr. O. Noordman's theology). Wageningen, 1959.
State University at Groningen.

PLESSIS, PAUL JOHANNES DU. *Τενεος The Idea of Perfection in the New Testament.* Kampen, 1959.
Theological School at Kampen.

Law

FELDBRUGGE, FERDINAND JOSEPH MARIA. *Schuld in het Sowjet strafrecht.* (Guilt in Soviet Criminal Law). Utrecht, 1959.
With a summary in English.
State University at Utrecht.

LANCEE, LAMBERTUS. *Fiscale winstsplitsing.* (The Division of Profits for Tax Purposes). Deventer, 1959.
University of Amsterdam.

ROVER, SJOERD. *Hoofdzaken der vervoerdersaansprakelijkheid in het zeerecht.* (Main Items of Carrier's Liability in Marine Law). Zwolle, 1959.
With summaries in English and French.
State University at Leyden.

SCHNEIDER, JOHANNES WILHELMUS. *Treaty-making Power of International Organizations.* Geneva, 1959.
University of Amsterdam.

Medicine

AARSEN, PIETER VAN. *Preventie van maagzuursecretie en experimentele maagzweren door floxine. Tevens een bijdrage tot de pathogenese van maagzweren.* (Prevention of Secretion of Gastric Acid and Experimental Gastric Ulcers induced by Floxine. Including a contribution to the pathogenesis of gastric ulcers). Amsterdam, 1959.
With a summary in English.
University of Amsterdam.

BENTHEM, LAMBERTUS HERMANUS BERNARDUS MARIA VAN. *Mucoviscoidosis.* Utrecht, 1959.
With a summary in English.
State University at Utrecht.

BOER, LUITJE DE. *Hydronephrosen, samengaand met onderpoolvaten* (Hydronephroses, in Combination with Lower Pole Vessels). Groningen, 1959.
With a summary in English.
State University at Groningen.

BOLT, AFINA PIETERDINA. *Een onderzoek naar de sociotherapeutische waarde van gezinsverpleging bij schizofrenie.* (An Inquiry into the Socio-therapeutic Value of Family Care in Cases of Schizophrenia). Groningen, 1959.
With summaries in English, French and German.
State University at Groningen.

BOORSMA, JOHAN PIET. *Cholangiografie en manometrie der galwegen en het post-cholecystectomie syndroma.* (Cholangiography and Manometry of the Gall Ducts and the Postcholecystectomy Syndrom). Oss, 1959.
With summaries and conclusions in English, French and German.
State University at Utrecht.

BOUTE, KAREL. *De centrale luxatieplastiek. Een nieuwe behandelingsmethode voor de coxarthrose.* (Central Dislocation Plasty. A new method of treating coxarthrosis). The Hague, 1958.
With summaries in English and French.
Roman Catholic University at Nymegen.

BREKEL, BERNARDUS AUGUSTINUS MARIA VAN DEN. *Over de canalis facialis en zijn röntgenbeeld.* (On the Canalis Facialis and its Shadow on the X-ray Screen). Amsterdam, 1959.
With a summary in English.
University of Amsterdam.

BRUIN, JAN DE. *Enige beschouwingen over het voorkomen en de therapie van de industriële loodvergiftiging.* (Some Observations on the Prevention and Therapy of Lead-Poisoning in Industry). Naarden, 1959.
With a summary in English.
University of Amsterdam.

DÄLDERUP, LOUISE MARIA. *Nutrition and Caries. A few observations in experimental animals.* Amsterdam, 1959.
With a summary in Dutch.
University of Amsterdam.

DANIËLS-BOSMAN, MARIA SOPHIA MARTINA. *Bij de mens gekweekte streptococci van groep B.* (Group B Streptococci Induced in Human Beings). Amsterdam, 1959.
With a summary in English.
University of Amsterdam.

DIJK, LEONARDUS MARIA VAN. *Over de oorzaken van nierstenen.* (On the Causes of Stones in the Kidneys). Roosendaal, 1959.
With a summary in English.
Roman Catholic University at Nymegen.

DRUCKER, FRANK. *Reticulose en ziekte van Kahler.* (Reticulosis and Kahler's Disease). Amsterdam, 1959.
With a summary in English.
University of Amsterdam.

EGGINK, ANTONIE ASSUERUS. *De betekenis van de arteriële en veneuze pulsatiecurven voor de diagnostiek van aangeboren hartgebreken.* (The Significance of Arterial and Venous Pulsation Curves in Diagnosing Hereditary Defects of the Heart). Amsterdam, 1959.
With a summary in English.
University of Amsterdam.

ES, JAN CORNELIS VAN. *Gezinnen met zwakzinnige kinderen. Een medisch-sociologische studie over de invloed op het gezin van de opname van een kind in een zwakzinnigeninrichting.* (Families with Mentally-deficient Children. A medical-sociological study about the influence of the institutionalization of a mentally deficient child on the family). Assen, 1959.
With a summary in English.
State University at Utrecht.

GEMERT, ADRIANUS JOZEF JOHANNES VAN. *Enige gegevens over het ulcus cruris, in het bijzonder zijn sociale betekenis.* (Some Data on Leg Ulcers, notably with regard to their social significance). Bergen op Zoom, 1959.
With a summary in English.
University of Amsterdam.

GINNEKEN, PETRUS JACOBUS JOSEPHUS VAN. *De richtmethode van Van der Plaats en Von Ronnen. Een bijdrage tot de operatieve behandeling van de dijhalsbreuk.* (The Directing Method of Van der Plaats and Von Ronnen. A contribution to the operative treatment of fractures of the femoral neck). Amsterdam, 1959.
With a summary in English.
University of Amsterdam.

GOEDHARD, GERARD. *Twee vergrotingsmethoden in de röntgendiagnostiek van het skelet.* (A Comparison Between the Direct and the Optical Method of Enlargement in Röntgenology of the Skeleton). Utrecht, 1959.
With a summary in English.
State University at Utrecht.

HILLEGONDSBERG, ARY JAN VAN. *Over de betekenis van enkele postnatale factoren voor het ontstaan van dento-maxillaire afwijkingen in het temporaire gebit.* (The Significance of Certain Postnatal Factors in the Pathogenesis of Malocclusion of the Deciduous Dentition). Utrecht, 1959.
With summaries in English, French and German.
State University at Utrecht.

HOUTSMULLER, ADELBERT JOHANNES. *Onderzoekingen over de kalium- en natriumstofwisseling van erythrocyten.* (Investigations on Potassium and Sodium Metabolism in Erythrocytes). Amsterdam, 1959.
With a summary in English.
State University at Utrecht.

JAMES, JOHANNES. *Over het lichaampje van Barr in de celkernen van zoogdieren.* (Concerning Barr's Body in the Cell Cores of Mammals). Amsterdam, 1959.
With a summary in English.
University of Amsterdam.

JANSONIUS, NOMDO JOHANNES. *Kwantitatieve bestudering der rouleauxvorming van erythrocyten door reflectiemeting (syllectometrie).* (Quantitative Studies on Rouleaux Formation of Erythrocytes by Reflection Measurement (Syllectometry.) Groningen, 1959.
With a summary in English.
State University at Groningen.

JONK, ARIËN. *Aspects and Problems of Industrial Medicine in Undeveloped and Underdeveloped Tropical Areas.* The Hague, 1959.
With summaries in French, Dutch and Spanish.
State University at Leyden.

KAPPELLE, WILLEM JAN. *Enige psychogenetische aspecten van het ontwikkelingsstotteren.* (Some Psychogenetic Aspects of Stuttering During Growth). Leyden, 1959.
With summaries in English, French and German.
State University at Leyden.

KOOPMANS, RINSE KORNELIS. *Een snelle, kwantitatieve micro-bepaling van de gevoeligheid van bacteriën voor antibiotica en chemotherapeutica.* (A Rapid, Quantitative Micro-determination of the Sensitivity of Bacteria to Antibiotics and Chemotherapeutic Means). Groningen, 1959.
With a summary in English.
State University at Groningen.

KREUKNIET, JOHANNES. *Longtuberculose en de astmatische constitutie.* (Tuberculosis of the Lungs and the Asthmatic Constitution). Nijkerk, 1959.
With a summary in English.
State University at Groningen.

KROLL, JOHANNES ANTONIUS. *Over de open ductus Botalli met pulmonale hypertensie.* (Concerning the Open Ductus Botalli in Pulmonary Hypertension). Assen, 1959.
With a summary and conclusions in English.
University of Amsterdam.

LEVIJ, IZAK SALOMON. *The Acute and Chronic Peptic Lesions of the Stomach and the Duodenum. Their frequency, mutual relation and correlation with other diseases.* The Hague, 1959.
State University at Utrecht.

LIPS, JOHANNES BERNARDUS. *Over de invloed van enkele antacida en anticholinergica op de pH van de maaginhoud bij patienten met een ulcus duodeni.* (The Influence of some Antacids and Anticholinergics on the pH of the Gastric Contents in Duodenal Ulcer Patients). Amsterdam, 1959.
With a summary in English.
State University at Leyden.

MANSOER, TENGKOE ADIL. *Een effectieve concentratie methode voor het opsporen van protozoaire darminfecties.* (An Effective Concentration Method for Tracing Protozoan Infections of the Intestine). Leyden, 1959.
With summaries in English and Bahasa Indonesia.
State University at Leyden.

MOOK, GERRIT ALBERT. *Directe oxymetrie tijdens hartcatheterisatie. Techniek en toepassingen van de catheter cuvette oxymeter.* (Direct Oximetry During Cardiac Catheterization). Assen, 1959.
With a summary in English.
State University at Groningen.

MOUTON, ROBERT PIETER. *Over het verband tussen toxiciteit*
zoan Infections of the Intestine). Leyden, 1959.
en lysongeniteit by Coryhebacterium diptheriae. (The Relationship Between Toxicity and Lysogenicity in C. Diphtheriae). Leyden, 1959.
With a summary in English.
State University at Leyden.

MUNTINGHE, OTTO GEORG. *Tuberculomen en haarden van intra-alveolaire tuberculose. Een pathologisch-anatomische studie.* (Tuberculomes and Foci of Intra-alveolar Tuberculosis. A pathological-anatomical study). Amsterdam, 1959.
With a summary in French.
University of Amsterdam.

MUSKENS, PETRUS LAMBERTUS ANTONIUS MARIA. *Acethylcholine-injecties in het gebied van de motorische eindplaat. Een onderzoek naar de plaats van inwerking.* (Acetylcholine Injections in the Motor End Plate Region. A search for the site of action). Leyden, 1959.
With a summary in English.
State University at Utrecht.

NOORDENBOS, WILLY. *Pain. Problems pertaining to the transmission of nerve impulses which give rise to pain.* Amsterdam, 1959.
With a summary in Dutch.
University of Amsterdam.

PLOEG, GERARD CHRISTIAAN JOANNES VAN DER. *Infecties met adeno-virussen bij kinderen. Virologisch en serologisch onderzoek.* (Adeno-virus Infections in Children. A virological and serological inquiry). Nymegen, 1959.
With a summary in English.
Roman Catholic University at Nymegen.

RADHAKISHUN, KRISHNA SHAWH. *Een studie betreffende de stofwisseling van het anticoagulans 3,3'-carboxy-methyleen-bis (4-hydroxucumarine) ethylester.* (A Study of the Metabolic Fate of the Anticoagulant 3,3'-carboxymethylene-bis (4. hydroxycoumarin) Ethyl Ester). The Hague, 1959.
With a summary in English.
State University at Utrecht.

RÜMKE, PHILIPP. *Auto-antilichamen tegen spermatozoën als oorzaak van onvruchtbaarheid bij de man.* (Auto-antibodies in Conflict with Spermatozoa as the Cause of Infertility in the Male). The Hague, 1959.
With a summary in English.
University of Amsterdam.

SANDE, WILHELMUS JOSEPHUS MARIA VAN DER. *Medical Life in Two Small Towns. A comparative study of the medical situation in Meriden, Conn., U.S.A. and Gouda, The Netherlands.* Bergen op Zoom, 1959.
University of Amsterdam.

SCHULTE, BENEDICTUS PETRUS MARIA. *Hermanni Boerhaave praelectiones de morbis nervorum. 1730–1735. Een medisch-historische studie van Boerhaave's manuscript over zenuwziekten.* (Hermanni Boerhaave praelectiones de morbis nervorum. 1730–1735. A medico-historical study of Boerhaave's manuscript on diseases of the nerves). Leyden, 1959.
With summaries in English and Russian.
State University at Leyden.

SITSEN, ADRIAAN WILLEM. *Cytologic Diagnosis of Thoracic Diseases.* Leyden, 1959.
With a summary in Dutch.
State University at Utrecht.

SLUZEWSKI, HANS. *Het zogenaamde retroperitoneale lipoom.* (The "Retroperitoneal" Lipoma). 1959.
With summary and conclusions in English.
University of Amsterdam.

TAN BIAN KIM. *On the First Cervical Dermatome. An experimental study in the cat.* Rotterdam, 1959.
With a summary in Dutch.
State University at Groningen.

TASELAAR, MARINUS. *Over binaurale selectieve versterking en de verstaanbaarheid van spraak.* (Binaural Selective Amplification and Intelligibility of Speech). Groningen, 1959.
With a summary in English.
State University at Groningen.

TRIMBOS, CORNELIS JOHANNES BAPTIST JOSEPH. *Geestelijke gezondheidsleer en geestelijke gezondheidszorg.* (Mental Health Science and Mental Health Care). Utrecht, 1959.
With a summary in English.
State University at Utrecht.

VALKENBURG, HANS ANTON. *Over de glomerulusfiltratie van natrium thiosulfaat.* (The Glomerular Filtration of Sodium Thiosulphate). The Hague, 1959.
With a summary in English.
State University at Utrecht.

VERSTEEG, JAN. *Differentiatie van virussen op grond van het cytopathogene effect in celcultures.* (Differentiation of Viruses on the Basis of the Cytopathogenic Effect in Cell Cultures). 1959.
With a summary in English.
State University at Leyden.

WAFELBAKKER, JACOBUS JOHANNES. *Enkele sociaal-geneeskundige aspecten van de wegverkeersongevallen.* (Some Socio-medical Aspects of Road Accidents). Assen, 1959.
With a summary in English.
State University at Leyden.

WIELINGA, WYBREN JOHANNES. *De contractuur van Dupuytren.* (Dupuytren's Contracture). 1959.
With a summary in English.
State University at Groningen.

WIGBOLDUS, JOHANNA MARGARETHA. *Over de aard en genese van de plaques seniles.* (On the Nature and Genesis of "plaques seniles"). Groningen, 1959.
With a summary in English.
Free (Reformed) University of Amsterdam.

YOUNG, EDWARD. *Intoxicatie door mercurius praecipitatus albus in de dermatologie.* (Intoxication Due to Ammoniated Mercury in Dermatology). 1959.
With a summary in English.
State University at Utrecht.

ZEVEN, REMKO. *De intraperitoneale toediening van antibiotica bij peritonitis appendicularis.* (Intra-peritoneal Introduction of Antibiotics in Peritonitis of the Appendix). Leyden, 1959.
With a summary and conclusions in English.
State University at Leyden.

Arts

BERK, CHRISTIAAN ALPHONS VAN DEN. *Y a-t-il un substrat cakavien dans le dialecte de Dubrovnik? Contribution à l'histoire de la langue serbo-croate.* The Hague, 1959.
State University at Utrecht.

BOSCH, JOHANNES VAN DEN. *Capa, basilica, monasterium et le culte du saint Martin de Tours. Etude lexicologique et sémasiologique.* Nymegen, 1959.
With a summary in Dutch.
Roman Catholic University at Nymegen.

BRAUN, CORNELIS GERARDUS FRANCISCUS. *Zelfkennis. Een studie over de zelfkennis en haar wijsgerige vooronderstellingen in de leer van Sint Thomas van Aquino.* (Self-Knowledge. A study of self-knowledge and its philosophical pre-suppositions in the teaching of St. Thomas Aquinas). Hilversum, 1959.
With a summary in French.
Roman Catholic University at Nymegen.

BROK, MARTINUS FRANCISCUS ARDINA. *De Perzische expeditie van keizer Julianus volgens Ammianus Marcellinus.* (The Persian Expedition of the Emperor Julian according to Ammianus Marcellinus's Account). Groningen, 1959.
State University at Leyden.

EMBREE, GEORGE DANIEL. *The Soviet Union Between the 10th and 20th Party Congresses, 1952–1956.* The Hague, 1959.
State University at Utrecht.

HERREMA, TIËDE. *Over revalidatie. Psychologische aantekeningen over de revalidatie van door een bedrijfsongeval getroffen arbeiders.* (Rehabilitation. Psychological notes on the rehabilitation of workers involved in industrial accidents). Arnhem, 1959.
With summaries and conclusions in English, French and German.
Roman Catholic University at Nymegen.

KAPER, WILLEM. *Einige Erscheinungen der kindlichen Spracherwerbung erläutert im Lichte des vom Kinde gezeigten Interesses für Sprachliches.* Groningen, 1959.
With summaries in English and French.
University of Amsterdam.

KOELMANS, LEENDERT. *Teken en klank bij Michiel de Ruyter.* (Symbol and Sound in Michiel de Ruyter). Assen, 1959.
State University at Utrecht.

KUIPER, GERRIT JOHAN MARIA. *Huis en klooster St. Antonius te Albergen.* (The St. Anthony Monastery at Albergen). 1959.
Roman Catholic University at Nymegen.

REININK, KASPER WILLEM. *Algunos aspectos literarios y lingüisticos de la obra de don Ramón Pérez de Ayala.* The Hague, 1959.
State University at Utrecht.

SILLEVIS, HENDRIKUS ADRIANUS. *De boer en zijn wereld. De boerenbevolking van de N.W.-Veluwe sociaal typologisch beschouwd.* (The Farmer and his World. The peasant population of the N.W. Veluwe from the socio-typological viewpoint). Assen, 1959.
With a summary in German.
State University at Utrecht.

WIEGERSMA, SIES. *Belangstellingsonderzoek bij de differentiatie na de lagere school.* (Inquiry into Interests of Pupil in the Post-Primary School Period). Leyden, 1959.
University of Amsterdam.

ZÜRCHER, ERIK. *The Buddhist Conquest of China. The spread and adaptation of Buddhism in early medieval China.* Leyden, 1959.
State University at Leyden.

Sciences

BANTJES, ADRIAAN. *Syntheses and Properties of Some Thiophene Oligomers.* The Hague, 1959.
State University at Leyden.

BECHT, GABRIËL. *Studies on Insect Muscles,* 1959.
With a summary in Dutch.
University of Amsterdam.

BIANCHI, FRANS. *Onderzoek naar de erfelijkheid van de bloemvorm bij Petunia.* (Inquiry into Heredity of the Shape of Flower in the Petunia). Amsterdam, 1959.
With a summary in English.
University of Amsterdam.

BOUVÈRE, KAREL LOUIS DE. *A Method in Proofs of Undefinability. With applications to functions in the arithmetic of natural numbers.* Amsterdam, 1959.
University of Amsterdam.

CHALLA, GERRIT. *The Formation of Polythylene Terephtalate by Ester Interchange. Equilibria kinetics and molecular weight distribution.* Hilversum, 1959.
With a summary in Dutch.
University of Amsterdam.

COSIJN, ADRIEN HENRICUS MARIA. *Diffusiepolarisatie van de waterstofelectrode.* (Diffusion Polarisation of the Hydrogen Electrode). Utrecht, 1959.
With summaries and conclusions in English.
State University at Utrecht.

DIGGELEN, JOHANNES VAN. *Photometric Properties of Lunar Crater Floors.* Groningen, 1959.
With a summary and introduction in Dutch.

DUYNSTEE, EDUARD FRANS JOZEF. *Kinetic Salt Effects in Dioxane-water.* The Hague, 1959.
With a summary in Dutch.
University of Amsterdam.

ELSKEN, JAN VAN DER. *The Infra-red Absorption Spectrum of the Bi-fluoride Ion in Solid Solutions.* The Hague, 1959.
With a summary in Dutch.
University of Amsterdam.

GRINTEN, CHRISTIAN OLAV VAN DER. *Carboxyl-activated Peptides in Yeast. Possible intermediates in protein synthesis.* Utrecht, 1959.
With a summary in Dutch.
State University of Utrecht.

GROBLER, JAN HENDRIK. *Initial Phase Ion Uptake by Plant Roots and the Interpretation of Root Potentials.* The Hague, 1959.
With a summary in Dutch.
University of Amsterdam.

HEINEKEN, FRIEDRICH WILHELM. *The Complex Refractive Index of Gases in the Microwave Region.* Amsterdam, 1959.
With a summary in Dutch.
University of Amsterdam.

KAASSCHIETER, JOHANNES PAULUS HEIMEN. *Foraminifera of the Eocene of Belgium.* 1959.
State University at Utrecht.

KAMP, WILLY. *Het bepalen en scheiden van alkaloiden in enige plantaardige geneesmiddelen en hun preparaten met behulp van ionenuitwisselaars op harsbasis.* (Determination and Separation of Alkaloids in a Number of Vegetable Drugs and their Preparation with the Aid of Ion-exchangers on a Resin Basis). The Hague, 1956.
With a summary in English.
University of Amsterdam.

KOCK, ROBERT JACOBUS DE. *Photochemische reacties en luminescentie van cyclohexadieen-1, 3, -phellandreen, de provitaminen D en verwante verbindingen.* (Photochemical Reactions and Luminosity of Cyclohexadies-1, 3, -phelladrene, the Provitamins D and Related Compounds). The Hague, 1959.
State University at Leyden.

KUIPERS, AUGUSTINUS MICHIEL GERARDUS. *Model en inzicht. Een confrontatie van de wetenschapsleer van Aristoteles met de feitelijke verklaringsprocedure in klassieke en moderne fysica.* (Model and Insight. A confrontation of Aristotle's theory of knowledge with the actual explanatory procedure in classical and modern physics). Assen, 1959.
With summaries in English, French and German.
Roman Catholic University at Nymegen.

LANZING, WILLEM JAN RUDOLPH. *Studies on the River Lamprey, Lampetra Fluviatilis, During its Anadromous Migration.* Utrecht, 1959.
State University at Utrecht.

LEENHOUTS, PIETER WILLEM. *A Monograph of the Genus Canarium (Burseraceae).* Leyden, 1959.
State University at Leyden.

LIGNY, CO LEO DE. *Enkele pH-standaardoplossingen in methanol-water mengsels.* (Some pH-standard Solutions in Methyl Alcohol Water Mixtures). Utrecht, 1959.
With a summary in English.
State University at Utrecht.

LUIJPEN, ANTONIUS FRANCISCUS MAURITIUS GERARDUS. *De invloed van het kaken op de rijping van gezouten maatjesharing.* (The Influence of Gibbing on the Ripening of Maatjes-Cured Herring). Utrecht, 1959.
With a summary in English.
State University at Utrecht.

MABESOONE, JANNES MARKUS. *Tertiary and Quaternary Sedimentation in a Part of the Duero Basin. (Palencia, Spain).* Leyden, 1959.
With summaries in Portuguese and Spanish.
State University at Leyden.

MACLEAN, JOHANNES. *De historische ontwikkeling der stootwetten van Aristoteles tot Huygens.* (The Historical Evolution of the Laws of Impulse from Aristotle to Huygens). Rotterdam, 1959.
Free (Reformed) University of Amsterdam.

MASTENBROEK, GERARD GODARD ADRIAAN. *Problemen bij de bereiding van infusievloeistoffen.* (Problems Involved in the Preparation of Liquids for Infusions). Amsterdam, 1959.
With a summary and conclusions in English.
University of Amsterdam.

MOUTON, ERIC JAN. *Het effect van weekmakers op polyvinylchloride.* (The Effects of Softeners on Polyvinyl Chloride). The Hague, 1959.
With a summary in English.
State University at Leyden.

NOSSIN, JAN JOSEP. *Geo-morphological Aspects of the Pisuerga Drainage Area in the Cantabrian Mountains (Spain).* Leyden, 1959.
With a summary in Spanish.
State University Leyden.

PLUIJGERS, CHRISTOFFEL WILLEM. *Direct and Systemic Antifungal Action of Eithiocarbamic Acid Derivatives.* Utrecht, 1959.
With a summary in Dutch.
State University at Utrecht.

POORT, CORNELIS. *De eiwitten van uit het pancreas geïsoleerde kernen en nucleoli.* (The Proteins of Nuclei and Nucleoli Isolated from the Pancreas). Utrecht, 1959.
With a summary in English.
State University at Utrecht.

PROP, NICOLAAS. *Protection Against Birds and Parasites in Some Species of Tenthredinid Larvae.* 1959.
State University at Groningen.

SCHERMERHORN, LODEWIJK JACOB GERARD CAREL EDUARD. *Igneous, Metamorphic and Oregeology of the Castro Daire-Sao Pedro do Sul-Sátao Region (Northern Portugal).* 1959.
University of Amsterdam.

SIEKMAN, JAKOB GERARD. *Measurements of Short and Very Short Lifetimes of Nuclear States.* Groningen, 1955.
With a summary in Dutch.

STRALEN, SJOERD JAN DERK VAN. *Warmte-overdracht aan kokende binaire vloeistofmengsels.* (Heat Transfer to Boiling Binary Liquid Mixtures). Wageningen, 1959.
With a summary in English.
State University at Groningen.

STRYDOM, BAREND CHRISTIAAN. *Abstract Riemann Integration.* Assen, 1959.
State University at Leyden.

TOBI, ALEXANDER CONSTANTIJN. *Petrographical and Geological Investigations in the Merdaret-Lac Crop Region (Belledonne Massif, France).* Leyden, 1959.
With summaries in French and Dutch.
State University of Leyden.

TOLK, ALBERT. *De alkalihalogenide tabletmethode in de infrarood spectrometrie.* (The Alkalihalide Wafer Technique in Infra-red Spectrometry). Utrecht, 1959.
With a summary in English.
State University at Utrecht.

UMANS, ANTONIUS JOHANNES HENRICUS. *Isomerie van benzochinonmono-oximen en van enige derivaten.* (Isomerism of Benzoquinone-mono-oximes and Some Derivatives). The Hague, 1959.
With a summary in English.
State University at Leyden.

VERHEYEN – VOOGD, CHRISTINA. *How Worker-Bees Perceive the Presence of their Queen.* 1959.
With a summary in German.
State University at Utrecht.

VIEREGGE, HENDRIK. *Reacties van acetyleenethers met carbonylverbindingen.* (Reactions of Acetylene Ethers with Carbonyl Compounds). Groningen, 1959.
With a summary in English.
State University at Groningen.

VOORST VADER, FREDERIK VAN. *The Adsorption o Surfactants at the Liquid-liquid Interface.* The Hague, 1959.
With a summary in Dutch.
State University at Utrecht.

VROOMEN, ANTONIUS REINERUS DE. *Transport door electronen en fononen in metalen.* (Conduction by Electrons and Focons in Metals). The Hague, 1959.
With a summary in English.
State University at Leyden.

VRIJ, AGIENUS. *Lichtverstrooiing door geladen colloidale deeltjes in zoutoplossingen.* (Light-scattering from Charged Colloidal Particles in Salt Solutions). Rotterdam, 1959.
With a summary in English.
State University at Utrecht.

WETTE, FREDERIK WILLEM DE. *Electrostatic Fields in Ionic Crystals.* The Hague, 1959.
With a summary in Dutch.
State University at Utrecht.

WIENER, JAN DIRK. *De stofwisseling van glucose bij normale en thiaminedeficiente duiven.* (The Metabolism of Glucose in Normal and Thiamine-deficient Pigeons). Utrecht, 1959.
With a summary in English.
State University at Utrecht.

ZOETEN, LEONARDUS WILLEM DE. *Onderzoek over de reactiviteit ten opzichte van jodium van de onderscheidene tyrosineresten van insuline.* (Research on the Jodine Reactivity of the Various Tyrosine Residues of Insulin). The Hague, 1959.
With a summary in English.
State University at Leyden.

ZWILLENBERG, LUTZ OSCAR. *Beiträge zur Kenntnis des geschichteten Pflasterepithels.* Basel, 1959.
With a summaries in English, French and Dutch.
University of Amsterdam.

Economics

AMBAGTSHEER, HENRI THEODOOR. *Jhr. Mr. Jeronimo de Bosch Kemper, behoudend maatschappijhervormer.* (Jeronimo de Bosch Kemper, Conservative Social Reformer). Amsterdam, 1959.
University of Amsterdam.

BOTTEMANNE, CASPER JOSEPHUS. *Principles of Fisheries Development.* Amsterdam, 1959.
University of Amsterdam.

Technical science

ASIJEE, JOHANNES. *Proeven over de warmte-afvoer van een splijtstofelement uit een kernreactor van het kokend water type.* (Experiments on the Heat Discharge of a Fission Element in a Boiling-Water Type Nuclear Reactor). Delft, 1959.
With a summary in English.
Technological University at Delft.

KNEGTEL, JACOB THEODOOR. *Het gedrag van carbonzuren in de Fischer-Tropsch synthese.* (The Behaviour of Carbonic Acids in the Fischer-Tropsch Synthesis). Delft, 1959.
With a summary in English.
Technological University at Delft.

KOOIMAN, PIETER. *Onderzoek van amyloid uit zaden.* (Research on Amyloid from Seeds). The Hague, 1959.
With a summary in English.
Technological University at Delft.

LOON, ARIE VAN. *Invloed van sterische belemmering van mesomerie op de absorptiespectra van amino-azoverbindingen in neutraal en zuur milieu.* (The Influence of Steric Impediment of Mesomism on the Absorption Spectra of Amino-Azo Compounds in a Neutral and Acid Milieu). Amsterdam, 1959.
With a summary in English.
Technological University at Delft.

SPIEGEL, EGBERT VAN. *Boundary Value Problems in Lifting Surface Theory.* Amsterdam, 1959.
Technological University at Delft.

VERMEER, JACOBUS. *On the Mechanism of Dielectric Breakdown in Glass and its Relation to Electrical Conduction.* Groningen, 1959.
With a summary in Dutch.
Technological University at Delft.

Veterinary science

BEKKUM, JACOB GIJSBERTUS VAN. *Neutraliserende antistoffen in sera van tegen mond- en klauwzeer geënte runderen.* (Neutralizing Anti-bodies in Sera of Cattle Vaccinated Against Foot-and-Mouth Disease). Wageningen, 1959.
With summaries in English, French and Dutch.
State University at Utrecht.

HOOFT, ADRIANUS JOANNES GERARDUS VAN 'T. *Keratogenesis imperfecta hereditaria bovina. Een erfelijk mond- en klauwgebrek bij het rund.* (Keratogenesis Imperfecta Hereditaria Bovina. A hereditary foot-and-mouth defect). Wageningen, 1959.
With summaries in English, French and German.
State University at Utrecht.

OTHER RECENT SCIENTIFIC PUBLICATIONS

Theology

BOSCH, DR. J. VAN DEN. *Capa Basilica Monsterium et le culte de St. Martin de Tours. Etude lexicologique et sémasiologique.* Nymegen, Dekker & van de Vegt, 1959, XVI + 166 pp. f 8,90

KAMEL HUSSEIN, DR. M. *City of Wrong (Qaryah Zálimah). A Friday in Jerusalem. Translated from the Arab with an introduction by Dr. Kenneth Cragg.* Amsterdam, Djambatan, 1959. 224 pp. f 13,50

ORDO DIVINI OFFICII RECITANDI. *Sacrique peragendi a clero ecclesiae cathedralis civitatis et dioecesis Ruraemundensis per annum domini 1959. Dispositus juxta kalendarium perpetuum in usum ejusdem dioecesis a.s.r.c. revisum et approbatum.* Roermond. J. J. Romen & Zn., 1959, 156 pp. f 5,90

REGALITA (LA), *Sacra. The Sacral Kingship. Contributi al tema dell' VIII congresso internazionale di storia delle religioni (Roma, aprile 1955.) Contributions to the central theme of the VIIIth international congress for the history of religions (Rome, April 1955). Publicated col concorso della Giunta centrale per gli studi storici, Roma. Published with the help of the Giunta centrale per gli studistorici.* Leyden, E. J. Brill, 1959. XV + 749 pp. f 55,—

Law

ALFARO, R. J., F. M. VAN ASBECK, L. BEAUFORT a.o. *Varia Juris Gentium. Questions of International Law. Liber amicorum Prof. J. P. A. François.* Leyden, A. W. Sythoff, 1959 428 pp. f 30,—

AMADOR, F. V. GARCIA. *The Exploitation and Conservation of the Resources of the Sea. A Study of Contemporary International Law. 2nd and enlarged ed.* Leyden, A. W. Sythoff, 1959. XIV + 212 pp. f 26,75

CHALUPA, V. *Rise and Development of a Totalitarian State. (Library of the Czechoslovak Foreign Institute in exile II).* Leyden, Stenfert Kroese, 1959. 294 pp. f 15.—

DROST, PIETER N. *The Crime of State. Penal protection for fundamental freedoms of persons and peoples. I. Humanicide. International governmental crime against individual human rights.* Leyden, A. W. Sythoff, 1959. X + 358 pp. f 28.90

II. Genocide. United Nations legislation on international criminal law. Leyden, A. W. Sijthoff, 1959. X + 212 pp. f 16.95

HOYT, EDWIN C. *The Unanimity Rule in the Revision of Treaties. A re-examination. Foreword by Philip C. Jessup. Part 1: General Treaties. Part 2: Specific Territorial Regimes.* The Hague, Martinus Nijhoff, 1959. XII + 264 pp. f 21.85

INTERNATIONAL BAR ASSOCIATION. *Seventh Conference of the International Bar Association. Cologne, Germany, July 21–25, 1958.* The Hague, Martinus Nijhoff, 1959. XVI + 559 pp. f 25.—

LAW IN EASTERN EUROPE. *A Series of Publications Issued by the Documentation Office for East European Law, University of Leyden, Edited by Z. Szirmai.*
No. 3: The Federal Criminal Law of the Soviet Union. Introduction by J. M. van Bemmelen. Russian and English text. Leyden, A. W. Sythoff, 1959. 157 pp. f 23.75

MAUNG MAUNG. *Burma's Constitution.* The Hague, Martinus Nijhoff, 1959. XII + 328 pp. f 18.50

PAUL, JULIUS. *The Legal Realism of Jerome N. Frank. A Study of Fact-scepticism and the Judicial Process. With a foreword by Leion Green.* The Hague, Martinus Nijhoff, 1959. XXII + 177 pp. f 17.90

PRESSEISEN, ERNST L. *Germany and Japan. A Study in totalitarian, 1933–1941.* The Hague, Martinus Nijhoff, 1958. XII + 368 pp. f 28.50

RÖLING, DR. B. V. A. *On International Law. European Law or World Law?* Amsterdam, Djambatan, 1959. 128 pp. f 6.90

SAÄB, DR. HASSAN. *The Arab Federalists of the Ottoman Empire.* Amsterdam, Djambatan, 1959. 336 pp. f 21,50

THOMAS, T. O. *The Right of Passage over Indian Territory. A Study of Preliminary Objections before the World Court. 2nd ed.* Leyden, A. W. Sythoff, 1959. 64 pp. f 6.—

VANDENBOSCH, AMRY. *Dutch Foreign Policy Since 1815. A Study in Small Power Politics.* The Hague, Martinus Nijhoff, 1959. XII + 318 pp. f 22.50

YOUNG, HARRY F. *Maximilian Harden, Censor Germaniae. The Critic in Opposition from Bismarck to the Rise of Nazism.* The Hague, Martinus Nijhoff, 1959. 288 pp. f 26.50

WAGNER, W. J. *The Federal States and their Judiciary. A Comparative Study in Constitutional Law and Organization of Courts in Federal States.* The Hague, Mouton & Co., 1959. 394 pp. f 32.—

Medicine

DIJKSTRA, M. D. C. *Bronchography.* Assen, Royal Van Gorcum, 1959. IX + 163 pp. f 19.50

FERTILITY AND STERILITY: *3rd World Congress on Fertility and Sterility.* Amsterdam, Excerpta Medica Foundation, 1959. f 11.50

HEALTH: *Aspects of Health Care and Society. Dedicated to Prof. Dr. G. C. E. Burger by Philips' Health centre.* Assen, Royal Van Gorcum, 1959. 248 pp. f 12.50

NOORDENBOS, W. *Pain. Problems pertaining to the transmission of nerve impulses which give rise to pain.* Amsterdam, Elsevier Publ. Comp., 1959. 182 pp. f 22.—

Arts

ACTES *du quinzième congrès international de psychologie. Bruxelles-1957. Proceedings of the Fifteenth International Congress of Psychology. Brussels-1957. Acta Psychologica.* Amsterdam, North-Holland Publ. Comp., 1959. XIX + 661 pp. f 30.—

AQUARONE, S. R. A. *The Life and Works of Emile Littré (1801/1881).* Leyden, Sythoff, 1959. 224 pp. f 18,50

ARASARATNAM, DR. J. *Dutch Power in Ceylon (1658–1687).* Amsterdam, Djambatan, 1959. 268 pp. f 32.—

BENEDICTIONES *episcopales e libro pontificali ecclesiae sancti Johannis ultraiectensis, ediderunt W. Jappe Alberts et C. A. Bouman. (Fontes Minores mediiaevi VII).* Groningen, J. B. Wolters, end of 1958. XVIII + 48 pp. f 3.25

BIBLIOGRAPHIE. *Linguistique de l'année 1956 et complément des années précédentes. Linguistic Bibliography for the Year 1956 and Supplement for Previous Years. Published by the Permanent International Committee of Linguists with a Grant from UNESCO.* Utrecht, Het Spectrum, 1959. XXXII + 330 pp. f 18.25

BLUMENBERG, W. *Karl Kautsky's Literarisches Werk. Eine bibliographische Übersicht.* The Hague, Mouton & Co., 1959, ca. 180 pp. ca. f 15.—

BOOST, C. *Dutch Art Today. Film. With 37 photographs. Commissioned by the Ministry of Education, Arts and Sciences.* Amsterdam, Contact, 1959. 100 pp. f 3.90

BOOST, C. *L'art néerlandais d'aujourd'hui. Le cinéma. Illustré de 37 photos. Publié sur commande du Ministère de l'Education, des Arts et des Sciences.* Amsterdam, Contact, 1959, 100 pp. f 3.90

BOSCH, F. D. K. *The Golden Germ. Introduction to Indian Symbolism.* The Hague, Mouton & Co., 1959, ca. 280 pp. + f 3.90

BRACKEN, HARRY M. *The Early Reception of Berkeley's Immaterialism, 1710–1733.* The Hague, Martinus Nijhoff, 1959, XII + 123 pp. f 9.50

CHAMBRE, H. *L'aménagement du territoire en U.R.S.S. Introduction à l'étude des régions économiques soviétiques.* The Hague, Mouton & Co., 1959, 280 pp. f 24.—

COMPOTISTA, GARLANDUS. *Dialecta. First edition of the manuscripts, with an introduction on the life and works of the author and on the contents of the present work, by L. M. de Rijk, Ph. D.* Assen, Royal Van Gorcum, 1959. LXIII + 221 pp. f 27.50

DELAVENAY, E. & K. *Bibliography of Mechanical Translation. Bibliographie de la Traduction Automatique.* The Hague, Mouton & Co., 1959, 48 pp. f 4.—

DURNOVO, NIKOLAJ. *Ocerk istorii russkogo jazyka.* Photomachanic reprint. The Hague, Mouton & Co., 1959. 384 pp. f 24.—

ENG-LIEDMEIER, A. M. VAN DER. *Soviet Literary Characters. An Investigation into Portrayal of Soviet Men in Russian Prose (1917–1953).* The Hague, Mouton & Co., 1959. 176 pp. f 16.—

FISCHER, W. *Die demonstrativen Bildungen der neuen arabischen Dialekte. Ein Beitrag zur historischen Grammatik des Arabischen.* The Hague, Mouton & Co., 1959. 229 pp. f 28.—

FRANKENSTEIN, DR. C. *Die Äusserlichkeit des Lebensstils. Ein Beitrag zur Pathologie der Ichentwicklung.* Amsterdam J. M. Meulenhoff, 1958. XII + 300 pp. f 16.50

GEIGER, BERNARD & OTHERS. *Peoples and Languages of the Caucasus. A synopsis.* The Hague, Mouton & Co., 1959. 77 pp. f 8.—

GOLLIET, P. *Les difficultés de la notion de sources littéraires.* Nymegen, Dekker & Van de Vegt, 1959. 44 pp. f 1.90

GONDA, J. *Epithets in the Rgveda.* The Hague, Mouton & Co., 1959. 300 pp. f 28.—

GONDA, J. *Four Studies in the Language of the Veda.* The Hague, Mouton & Co., 1959. 194 pp. f 20.—

GONDA, J. *Stylistic Repetition in the Veda.* Amsterdam, North-Holland Publ. Comp., 1959. 416 pp. f 48.—

GOONEWARDENA, DR. K. W. *The Foundation of Dutch Power in Ceylon (1638–1658).* Amsterdam, Djambatan, 1959. 216 pp. f 30.—

HALLE, MORRIS. *The Sound Patterns of Russian. A Linguistic and Accoustical Investigation.* The Hague, Mouton & Co., 1959. 200 pp. f 36.—

HARTMANN, P. *Die Sprache als Form. (Theorie der Sprache, I).* The Hague, Mouton & Co., 1959. 142 pp. f 12.—

HARTMANN, P. *Zur Konstitution einer allgemeinen Grammatik. (Theorie der Sprache, II).* The Hague, Mouton & Co., 1959. 120 pp. f 12.—

HARWARD JR., VERNON J. *The Dwarfs of Arthurian Romance and Celtic Tradition.* Leyden, E. J. Brill, 1958. 164 pp. f 15.—

HAYWOOD, B. *Novalis. The Veil of Imagery. A Study of the Poetic Works of Friedrich von Hardenberg (1772–1801).* The Hague, Mouton & Co., 1959. 171 pp. f 12.—

HERDAN, G. *Type-Token Mathematics. A Text-Book of Mathematical Linguistics.* The Hague, Mouton & Co., 1959. 320 pp. f 36.—

JOHNSON, OLIVER A. *Rightness and Goodness. A Study in Contemporary Ethical Theory.* The Hague, Martinus Nijhoff, 1959. VII + 163 pp. f 15.25

JUDSON, J. RICHARD. *Gerrit van Honthorst. A Discussion of his Position in Dutch Art.* The Hague, Martinus Nijhoff, 1959. XX + 315 pp. f 18.50

KUNST, JAAP. *Ethnomusicology.* The Hague, Martinus Nijhoff, 1959. 3rd Edition. X + 303 pp. f 23.75

LEDNICKY, W. *Henryk Sienkiewicz.* The Hague, Mouton & Co., 1959. 100 pp. f 10.—

LOZINSKI, PHILIP. *The Original Homeland of the Parthians.* The Hague, Mouton & Co., 1959. 55 pp. f 4.—

MARTIN, B. G. *German-Persian Diplomatic Relations, 1873 1912.* The Hague, Mouton & Co., 1959. 220 pp. f 24.—

MI LA RAS PA I RNAM THAR. *Texte tibétain de la vie de Milarepa. Edité par J. W. de Jong.* The Hague, Mouton & Co., 1959. 218 pp. f 24.—

PAFF, W. J. *The Geographical and Ethnic Names in the Thidriks Saga: A Study in Germanic Heroic Legend.* The Hague, Mouton & Co., 1959. 248 pp. f 23.—

PLOEG, O. P., J. VAN DER. *Le rouleau de la guerre. Traduit et annoté avec une introduction.* Leyden, E. J. Brill, 1959. 208 pp. f 25.—

PROCEEDINGS *of the Fifteenth International Congress of Psychology.* Amsterdam, North-Holland Publ. Comp., 1959. XIX + 658 pp. f 30.—

PULGRAM, ERNST. *Introduction to the Spectrography of Speech.* The Hague, Mouton & Co., 1959. 174 pp. f 12.—

ORIENTALISTIK, *Handbuch der. Herausgegeben von B. Spuler. Erste Abteilung. Der nahe und der mittlere Osten.* BAND II. *Keilschriftforschung und alte Geschichte Vorderasiens. Erster und zweiter Abschnitt. Geschichte der Forschung, Sprache und Literatur. Lieferung 1. Das Sumerische. Von A. Falkenstein.* Leyden, E. J. Brill, 1959. f 15.—

ROGIER, DR. L. J. *Die Wahrheit und die Grundsätze der akademischen Freiheit.* Amsterdam, Urbi et Orbi, 1958. 28 pp. f 2.—

SCHOONEVELD, C. H. VAN. *A Semantic Analysis of the Old Russian Finite Preterite System.* The Hague, Mouton & Co., 1959. 180 pp. f 24.—

SHILS, E. *The Intellectual Between Tradition and Modernity; the Indian Situation.* The Hague, Mouton & Co., 1959. 128 pp. f 12.—

SCHURMAN, H. F. *The Mongols of Afghanistan. An Ethnography of the Moghôls of Afghanistan.* The Hague, Mouton & Co., 1959. 420 pp. f 38.—

SOLOVIEV, A. V. *Holy Russia. The History of a Religious-Social Idea.* The Hague, Mouton & Co., 1959. 60 ppl. f 5.—

TIBULLUS, ALBIUS. *Aliorumque carminum libri tres. Edidit Fredericus Waltharius Lenz.* Leyden, E. J. Brill, 1959. 174 pp. f 30.—

VOGEL, C. J. DE. *Greek Philosophy. A Collection of Texts. With notes and explanations. Vol. 3: The Hellenistic-Roman Period.* Leyden, E. J. Brill, 1959. XV, 673 pp. f 33.—

WEINREICH, U. & B. *Yiddish Language and Folklore. A Selective Bibliography for Research.* The Hague, Mouton & Co., 1959. 66 pp. f 6.—

WEINTRAUB, WIKTOR. *Literature as Prophecy. Mickiewicz and Martinist Poetics; Scholarship and Prophecy in Parisian Lectures.* The Hague, Mouton & Co., 1959. 90 pp. f 8.—

WESTERINK, L. G. *Damascius.* Amsterdam, North-Holland Publ. Comp., 1959. 149 pp. f 22.50

ZANDT, R. VAN. *The Metaphysical Foundations of American History.* The Hague, Mouton & Co., 1959. 269 pp. f 24.—

Sciences

AJZENBERG, SELOVE F. & T. LAURITSEN. *Energy Levels of Light Nuclei VI.* Amsterdam, North-Holland Publ. Comp., 1959, 340 pp. f 20.—

ALDERS, L. *Liquid-Liquid Extraction.* Second completely revised and enlarged edition. Amsterdam, Elsevier Publ. Comp., 1959. 226 pp. f 22.—

BERNAYS, P. *Axiomate Set Theory.* Amsterdam, North-Holland Publ. Comp., 1959. VIII + 228 pp. f 22.50

BODEWIG, E. *Matrix Calculus.* Second completely revised edition. Amsterdam, North-Holland Publ. Comp., 1959 XII + 452 pp. f 32.50

BOVET ET AL: *Curare and Curare-Like Agents.* Amsterdam, Elsevier Publ. Comp., 1959. 512 pp. f 45.—

COLEOPTERORUM CATALOGUS, *Supplementa. Edita A. W. D. Hincks. Pars 35, Fasc. 2. Erich Uhmann, Chrysomelidae: Hispinae. Hispinae Africanae, Eurasiaticae, Australicae.* Editio secunda. The Hague, Dr. W. Junk, 1959. IX + 247 pp. f 75.—

ENDT, P. M. & M. DEMEUR. *Nuclear Reactions.* Amsterdam, North-Holland Publ. Comp., 1959, XII + 504 pp. f 43.—

FOSSILIUM CATALOGUS. *Editus A. W. Jongmans. Vol. 2. Plantae W. Jongmans & S. J. Dijkstra. Filicales, Pteridosperma cycadales. Pars 36, no. 9.* The Hague, Dr. W. Junk, 1959. 152 pp. f 42.—

FRAENKEL, A. A. & Y. BAR-HILLEL. *Foundations of Set Theory.* Amsterdam, North-Holland Publ. Comp., 1959. X + 416 pp. f 42.—

GRANT, VERNE. *Natural History of the Phlox Family. Vol. I. Systematic Botany.* The Hague, Martinus Nijhoff, 1959. XV + 280 pp. f 19.—

HEYTING, A. *Constructivity in Mathematics. Proceedings of the Colloquium held at Amsterdam, 1957.* Amsterdam, North-Holland Publ. Comp., 1959. VIII + 297 pp. f 30.—

JORISSEN, W. P. *Induces Oxidation.* Amsterdam, Elsevier Publ. Comp., 1959. 204 pp. f 22.—

KANTOROVICH, L. V. & V. I. KRYLOV. *Approximate Methods of Higher Analysis. Translated from the fourth Russian edition by Curtis D. Benster.* Groningen, Noordhoff, end of 1959. 697 pp. f 64.—

LEDERER, M. *Chromatographic Reviews. Amsterdam,* Elsevier Publ. Comp., 1959. 286 pp. f 24.—

LEVEY, M. *Chemistry and Chemical Technology in Ancient Mesopotamia.* Amsterdam, Elsevier Publ. Comp., 1959. 232 pp. f 20.—

MAARLEVELD, G. C. *Pebble Containing Middle-pleistocene Sediments in the Netherlands and Adjacent Areas. (With English Summary). (Series C VI – no. 6).* Maastricht, Ernest van Aelst, 1958. f 17.40

MARTIN, R. M. *Towards A Systematic Pragmatics.* Amsterdam, North-Holland Publ. Comp., 1959. XV + 104 pp. f 12.—

MCCONNEL. *Quantum Particle Dynamics.* Amsterdam, North-Holland Publ. Comp., 1959. XI + 253 pp. f 20.—

MERCIER, A. *Analytical and Canonical Formalism in Physics.* Amsterdam, North-Holland Publ. Comp., 1959. VIII + 222 pp. f 20.—

MONOGRAPHIAE BIOLOGICAE. Vol. 5, no. 2. *On Ageing and Old Age. Basic Problems and Historic Aspects of Gerontology and Geriatrics, by M. D. Grmek.* The Hague, Dr. W. Junk, 1959. 109 pp. with ill. f 14.—

NAIMARK, M. A. *Normed Rings.* Translated from the Russian by Leo F. Boron. Groningen, Noordhoff ,to be published in 1959.

NOVOZHILOV, V. V. *Theory of Thin Shells.* Translated from the Russian by P. G. Lowe. Edited by J. R. Radok. Groningen, Noordhoff, to be published in 1959.

NUCLEAR MATERIALS. *Journal of Nuclear Materials. Journal des Matériaux Nucléaires. A Journal on Metallurgy, Ceramics and Solid State Physics in the Nuclear Energy Industry. Editors: R. W. Cahn, J. P. Howe & P. Lacombe. 4 issues a year, No. 1 April 1959.* Amsterdam, North-Holland Publ. Comp., 1959. Per Vol. of 360 pp. f 68.—

OYEN, F. H. VAN. *Contribution à la Connaissance du Genre Adelophtalmus Jordan et Meyer 1854.* Maastricht, Ernest van Aelst, 1958. 72 pp. f 13.70

PEETERS, H. *Protides of the Biological Fluids. Fifth Colloquium.* Amsterdam, Elsevier Publ. Comp., 1959. 350 pp. f 24.—

POGOROLOV, A. V. *Differential Geometry.* Translated from the first Russian edition by Leo F. Boron. Groningen, Noordhoff, 1959. f 16.50

RODD, E. H. *Chemistry of Carbon Compounds. Vol. IV B.* Amsterdam, Elsevier Publ. Comp., 1959. 674 pp. f 61.50

SANSONE, G. & DR. J. C. H. GERRETSEN. *Lectures on the Theory of Functions of a Complex Variable. Vol. I. Holomorphic Functions.* Groningen, Noordhoff, to be published in 1959.

STRUCTURE REPORTS. *General Editor A. J. C. Wilson. Vol. 14. Supplementary volume and cumulative index for 1940–1950. Published for the International Union of Crystalography.* Utrecht, A. Oosthoek, 1959. VIII + 216 pp. f 35.—

TURNING POINTS IN PHYSICS. *A Series of Lectures given at Oxford University in Trinity Term 1958, by A. C. Crombie, R. J. Blin-Stoyle, D. Ter Haar a.o.* Amsterdam, North-Holland Publ. Comp., 1959. VIII + 192 pp. f 10.50

WAPSTRA, A. H., G. J. NIJGH & R. VAN LIESHOUT. *Nuclear Spectroscopy Tables.* Amsterdam, North-Holland Publ. Comp., 1959. VII + 137 pp. f 30.—

WILSON, CECIL L. & DAVID W. WILSÓN. *Comprehensive Analytical Chemistry. Vol. I A.* Amsterdam, Elsevier Publ. Comp., 1959. 598 pp. f 47.50
After completion of Volume I (Part IA, IB and IC) f 55.—

Economics and Social sciences

ARROW, K. J. & M. HOFFENBERG. *A Time Series Analysis of Interindustry Demands.* Amsterdam, North-Holland Publ. Comp., 1959. X + 289 pp. f 27.50

BJERVE, J. B. *Planning Norway 1947–1956.* Amsterdam, North-Holland Publ. Comp., 1959. XX + 384 pp. f 35.—

CHAKRAVARTY, S. *The Logic of Investment Planning.* Amsterdam, North-Holland Publ. Comp., 1959. X + 160 pp. f 15.—

MEERLOO, DR. J. A. M. *Dance Craze and Sacred Dance.* Amsterdam, Djambatan, 1959. 160 pp. f 17.50

SCHAPER, DR. B. W. *Albert Thomas. Trente ans de réformisme social. Préface de M. Marius Moutet.* Assen, Royal Van Gorcum, 1959. XIII + 384 pp. f 22.—

SIERKSMA, DR. F. *The Gods As We Shape Them.* Amsterdam, Djambatan, 1959. 178 pp. f 28.—

SIMONS, DR. R. D. G. PH. *Skin Colour and Human Relations.* Amsterdam, Djambatan, 1959. 154 pp. f 9.75

TINBERGEN, J. *Selected Papers.* Amsterdam, North-Holland Publ. Comp., 1959. XII + 318 pp. f 30.—

VREEDE, CORALIE. *L'émancipation de la femme indonésienne.* The Hague, Mouton & Co., 1959. 191 pp. f 16.—

WELLS, G. A. *Herder and After: A Study in the Development of Sociology.* The Hague, Mouton & Co., 1959. ca. 320 pp. f 25.—

WESTSTRATE, C. *Economic Policy in Practice: The Netherlands 1950–1957.* Leyden, Stenfert Kroese, 1959. 211 pp. f 17.—

Technical science

BOFARULL Y SANS, FRANCISCO DE. *Animals in Watermarks. Los animales en las marcas del papel. Translated from the Spanish by A. J. Henschel.* Hilversum, The Paper Publications Society, 1959. 180 pp. f 80.—

DAVIES, R. *Friction and Wear.* Amsterdam, Elsevier Publ. Comp., 1959. 200 pp. f 19.—

MANSUM, C. J. VAN. *Dictionary of Building Construction. In four languages: English/American, French, Dutch and German.* Amsterdam, Elsevier Publ. Comp., 1959. 472 pp. f 45.—

MCKELVEY, K. K. & MAXEY BROOKE. *The Industrial Cooling Tower.* Amsterdam, Elsevier Publ. Comp., 1959. 430 pp. f 47.50

PETROLEUM. *3e Congrès Européen d'Equipement Pétrolier: Communications – Paris 22–25 juin 1959. Text in French English and German.* Amsterdam, Excerpta Medica Foundation, 1959. 557 text pp. and 56 ill. pp. f 50.—

RASSWEILER, G. M. & W. L. GRUBE. *Internal Stresses of Fatigue of Metals.* Amsterdam, Elsevier Publ. Comp., 1959. 466 pp.

VISSER, A. *Telecommunication Dictionary. In six languages: English/American, French, Spanish, Italian, Dutch and German.* Amsterdam, Elsevier Publ. Comp., 1959. 1,020 pp. f 77.50

VOORN, HENK. *The Paper Mills of Denmark & Norway and their Watermarks.* Hilversum, The Paper Publications Society, 1959. 80 pp.

YITZHAKI, D. *The Design of Prismatic and Cylindrical Shell Roofs.* Amsterdam, North-Holland Publ. Comp., 1959. XVI + 253 pp. f 42.—

Agricultural science

JACOBY, ERICH H. *Land Consolidation in Europe. A Study Based upon the Work of the Working Party on Consolidation of Holdings.* Wageningen, H. Veenman & Zn., 1959. 142 pp. f 9.50

SMITS, H. & A. J. WIGGERS. *Soil Survey and Land Classification, as applied to Reclamation of the Sea Bottom Land in the Netherlands.* Wageningen, H. Veenman & Zn., 1959. 60 pp. f 3.80

General works

Atlas of the Arab World and the Middle East. Amsterdam, Djambatan, 1959. f 18.50

BERGH, DR. G. VAN DEN. *L'heure Commune Européenne – The Euroclock-L'Orologie Europeo – Die Euro-Uhr.* Haarlem, Tjeenk Willink & Zn., 1958. 128 pp. f 5.—

RONART, DR. STEPHAN & NANDY RONART. *Concise Encyclopaedia of Arabic Civilization. The Arab East.* Amsterdam, Djambatan, 1959. 602 pp. f 30.—

BASIC DATA ON INTERNATIONAL COURSES OFFERED IN THE NETHERLANDS[1]

(see also the "International Courses" Section in this Bulletin)

Institute of Social Studies

Information: The Rector, Institute of Social Studies, 27, Molenstraat, The Hague.

COURSES OFFERED:

a. Two-year Course in the Social Sciences. The study of social change and economic development in the widest sense. The course leads to the degree of Master of Social Sciences.
REQUIREMENTS FOR ADMISSION: Advanced academic standing in one of the social sciences.
NEXT COURSE STARTING: September 1960. Closing date for applications: June 1, 1960.[2]

b. Six-Month Advanced Diploma Course in Public Administration.
REQUIREMENTS FOR ADMISSION: Advanced academic status and preferably some years of experience in the public service.
NEXT COURSE STARTING: January 1960. Closing date for applications: October 1, 1959.[2]

c. Six-Month Advanced Diploma Course in Economic Planning and Social Accounting.
REQUIREMENTS FOR ADMISSION: Advanced academic status and preferably some years of experience in the public service.
NEXT COURSE STARTING: January 1960. Closing date for applications: October 1, 1959.[2]

d. Seven-Month Advanced Diploma Course in Social Welfare Policy for Low Income Countries.

REQUIREMENTS FOR ADMISSION: Practical experience in social work, preferably at the teaching and public service level.

NEXT COURSE STARTING: September 1960. Closing date for applications: June 1, 1960.[2]

Technological University at Delft — Netherlands Universities Foundation for International Co-operation

Information: Netherlands Universities Foundation for International Co-operation, 27, Molenstraat, The Hague.

COURSE OFFERED:

International Course in Hydraulic Engineering. Three branches of study:
1. Tidal and coastal engineering;
2. Reclamation;
3. Rivers and navigation works.

The course lasts eleven months and leads to a diploma.

REQUIREMENTS FOR ADMISSION: a degree in engineering of a recognized institution of higher learning.

NEXT COURSE STARTING: October 1959 (at Delft).

State University at Leyden — Netherlands Universities Foundation For International Co-operation

Information: Netherlands Universities Foundation for International Co-operation, 27, Molenstraat, The Hague.

COURSE OFFERED:

Summer Course of the Combined Netherlands Universities, 1959.
Subject: Europe and the Netherlands.

REQUIREMENTS FOR ADMISSION: Students or graduates of an institute of higher education,
NEXT COURSE: July 1960.

Research Institute for Management Science — Netherlands Universities Foundation for International Co-operation

Information: Netherlands Universities Foundation for International Co-operation, 27, Molenstraat, The Hague.

COURSE OFFERED:

International Course on Small-Scale Industries. Theoretical and practical training in investigating and solving the specific problems of small-scale industries, and in finding a methodology which can be applied to the establishment of new industries. Successful attendance of the course leads to a diploma.

REQUIREMENTS FOR ADMISSION: B.Sc. or M.Sc. in engineering or equivalent degree of recognized universities.

NEXT COURSE: November 1959 until end of April 1960; May 1960 until end of October 1960.

International Training Centre for Aerial Survey

Information: The Dean, International Training Centre for Aerial Survey, 3, Kanaalweg, Delft.

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[1] Courses are given in English only, unless otherwise mentioned.
[2] For Indian Citizens application will close one month earlier.

COURSES OFFERED:

- *a.* Photogrammetry, including cartography, topography and theory of errors;
- *b.* Photogeology;
- *c.* Use of air photographs for soil survey and other agricultural purposes;
- *d.* The same for forestry and other sylvicultural purposes;
- *e.* Air photography and survey navigation.

Lectures and instruction are given in English, French or German.

Courses are adapted to individual needs, and may therefore vary from some months to two years.

REQIREMENTS FOR ADMISSION: Dependent upon the individual student's programme of study.

NEXT COURSE(S) STARING: January 1960 and September 1960.

Roman Catholic University at Nymegen

Information: Faculty of Theology, 13, Wilhelminasingel, Nymegen.

COURSE OFFERED:

"Theological Week," July, 1959.

Institute of Oriental Studies, Leyden

Information: The Secretary, Institute of Oriental Studies, 61, Rapenburg, Leyden.

COURSES OFFERED:

Language and culture of Indonesia and Malaya, the Arabian Countries, Japan, China.

REQUIREMENTS FOR ADMISSION: Candidates must be qualified for university studies in their own country.

NEXT COURSES STARTING: October 1960 (duration 3 or 7 months).

The Hague Academy of International Law

(Founded in 1923 with aid from the Carnegie Endowment).

Information: The Secretariat, The Hague Academy of International Law, Peace Palace, The Hague.

COURSES OFFERED:

- *a.* 31st Summer Session, 1960 (consisting of two periods). Lectures on international law in English and French are given in both periods. At the end of each period students admitted to the course sit for examination, which leads in the case of a pass to the award of a diploma.

  REQUIREMENTS FOR ADMISSION: Study and/or practical experience in international law; university professors and students, civil servants, judges, lawyers, diplomatic, consular and international officers.

  NEXT COURSE: 1st period: July 11–29, 1960; 2nd period: August 1–19, 1960.
- *b.* 4th Session of the Centre of Studies and Research in International Law and International Relations, August 23–October 2. During this session 30 specially selected scholars will by dealing with case-studies in international law.

  Attendants of the course will be divided into an English-speaking and a French-speaking group, each with its own Director of Studies.

  REQUIREMENTS FOR ADMISSION: advanced academic degree, such as the Academy's diploma, or proof of at least three years' actual practice in international affairs.

Netherlands Universities Foundation for International Co-operation

Information: NUFFIC, 27, Molenstraat, The Hague.

COURSE OFFERED:

"Survey of the Netherlands" — introductory courses on the Netherlands, lasting about one week.

REQUIREMENTS FOR ADMISSION: usual requirements for university study.

NEXT COURSE: courses will be given during summer months, upon request, for groups of at least 15 students.

Bouwcentrum (Building Centre)

Information: Bouwcentrum, P.O. Box 299, Rotterdam.

COURSE OFFERED:

International Course on Building – in co-operation with the Central Organization for Applied Scientific Research in the Netherlands, TNO, and the International Federation of Housing and Town Planning. The course is on the graduate level and lasts six months. Its object is to present a systematic basis for the treatment of the problems encountered in the building industry and to suggest a number of practical methods for tackling these problems.

REQUIREMENTS FOR ADMISSION: B.A., B Sc. or equivalent degree of recognized universities or colleges. Applicants must, in their own countries, have a task concerned with building.

NEXT COURSE STARTING: October 1960.

The Philips International Institute of Technological Studies

Information: Director of Studies, Philips International Institute, Eindhoven.

COURSES OFFERED:

a. Individual, theoretical and experimental curricula on any subject within the range of Philips' activities; for instance, electronics and applications thereof, X-rays, light and lighting, etc.
b. Three-month course of lectures on basic electronics (October–December).
c. Three-month advanced-level course of lectures. The main subject of this course may differ from year to year but will generally be related to some form of applied electronics.

Teaching language is English. Nominal duration of a complete period of study is one year. REQUIREMENT FOR ADMISSION: a graduate science or engineering degree.

Commencement of next course: In view of the individual character of the study, students may enter upon their course at any date; the courses mentioned will, however, usually start in October and February.

International Agricultural Centre at Wageningen.

Information: Director, International Agricultural Centre, 1, Generaal Foulkesweg, Wageningen.

COURSES OFFERED:

a. Research and specialization facilities in special branches of agricultural science, after completion of which a certificate is awarded. Training is adapted to individual needs and may vary from 3 to 12 months.

   REQUIREMENTS FOR ADMISSION: in general, M. Sc. or equivalent degree of recognized universities or colleges.

b. International meeting on methods and programme planning in agricultural and home economics extension, Wageningen, July 1960. Further details in next issue.

c. International meeting on the organization of plant protection, Wageningen, August 1960. Further details in next issue.

INTERNATIONAL COURSE ON SMALL-SCALE INDUSTRIES

The Research Institute for Management Science at Delft will organise the 6th International Course on Small-Scale Industries between November 3, 1959 and April 27, 1960.

This six-month's postgraduate course is designed for persons preferably with an engineering degree or a comparable level of knowledge obtained through several years of industrial experience. The course is divided into two equal periods, one dedicated to theoretical instruction and the other to individual practical work. Instruction is given in the English language.

A choice can be made from three branches of study

- **Establishment of new industries**
- **Improvement of conditions in existing industries**
- **Establishment and management of training centres, institutions and organisations for the promotion of, and assistance to, small-scale industries.**

All enquiries should be addressed to:
THE NETHERLANDS UNIVERSITIES FOUNDATION FOR INTERNATIONAL CO-OPERATION
27, Molenstraat, the Hague, the Netherlands.

The following institutions of higher education participate in the Netherlands Universities Foundation for International Co-operation:

State University at Leyden
State University at Groningen
State University at Utrecht
University of Amsterdam
Free (Reformed) University of Amsterdam
Roman Catholic University at Nymegen
Technological University at Delft
Agricultural University at Wageningen
Netherlands School of Economics at Rotterdam
Roman Catholic School of Economics at Tilburg
Technological University at Eindhoven

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